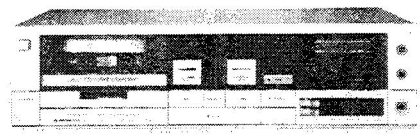
PIONEER®

Service Manual

REPAIR & ADJUSTMENTS



ORDER NO.
ARP-371-0

STEREO CASSETTE TAPE DECK

CT-50R

MODEL CT-50R COMES IN SEVEN VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	AC120V only	U.S.A. model
KC	AC120V only	Canada model
HEM	AC220V, 240V (switchable)	European continent model
HB	AC220V, 240V (switchable)	United Kingdom model
HP	AC220V, 240V (switchable)	Australia model
D	AC120V, 220V, 240V (switchable)	General export model
D/G	AC120V, 220V, 240V (switchable)	U.S. Military model

- **This service manual is applicable to the KU type. For servicing of the D and D/G types, please refer to pp. 50~51.**
- **For the circuit and mechanism descriptions, please refer to the CT-50R service manual (ARP-439-0).**
- **Ce manuel d'instruction se refère au mode de réglage, en français.**
- **Este manual de servicio trata del método de ajuste escrito en español.**

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS [USA] INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

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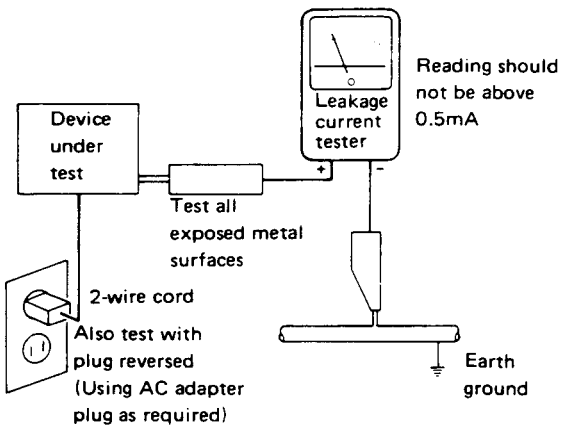
SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Reading should not be above 0.5mA
Leakage current tester
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

1. SPECIFICATIONS

System ..... Compact cassette, 2-channel stereo
Heads ..... "Hard Permalloy" recording/playback head x 1
"Ferrite" erasing head x 1
Motor ..... DC servo capstan motor x 1
DC reel motor x 1
Wow/Flutter ..... No more than 0.038% (WRMS)
No more than ± 0.16% (DIN)
Fast Winding Time ..... Approx. 90 seconds (C-60 tape)
Frequency Response
– 20 dB recording:
Normal tape ..... 25 to 17,000 Hz
(30 to 16,000 Hz ± 3 dB)
Chrome tape ..... 25 to 17,000 Hz
(30 to 16,000 Hz ± 3 dB)
Metal tape ..... 25 to 18,000 Hz
(30 to 16,500 Hz ± 3 dB)
0 dB recording:
Chrome tape ..... 25 to 9,000 Hz
Metal tape ..... 25 to 14,000 Hz
Signal-to-Noise Ratio
Dolby NR OFF ..... More than 58 dB
Noise Reduction Effect
Dolby type B NR ON ..... More than 10 dB (at 5 kHz)
Dolby type C NR ON ..... More than 19 dB (at 5 kHz)
Harmonic Distortion ..... No more than 1.0% (0 dB)
Input (Sensitivity)
MIC (L, R) ..... 0.25 mV, 6 mm diam. jack
(Source impedance; 600 Ω)
LINE (INPUT) ..... 50 mV
(Input impedance 50 kΩ)
Output (Reference level)
LINE (OUTPUT) ..... 450 mV
(Output impedance 3.2 kΩ)
Headphones ..... 0.25 mW
(Load impedance 8 Ω)

SUBFUNCTIONS

- IC-based full logic control
- Dolby NR system (type B and C)
- Auto tape selector function
- Timer standby function
- REC muting function (Space mute)
- Air damp eject function
- Reverse playback/reverse recording
- MS/SKIP function
- Three-column digital counter

MISCELLANEOUS

Power Requirements
KU and KC models ..... AC 120 V, 60 Hz
D and D/G models ..... AC 120/220/240V, 50/60 Hz (switchable)
HB and HP models ..... AC 240 V, 50/60 Hz
HE model ..... AC 220V, 50/60 Hz

Power Consumption
KU and KC models ..... 31 watts
D and D/G models ..... 26 watts
HB, HP and HE models ..... 35 watts

Dimensions ..... 420 (W) x 120 (H) x 284 (D) mm
16-9/16 (W) x 4-12/16 (H) x 11-3/16 (D) in
Weight (without packaging) ..... 5.4 kg (11 lb 14 oz)

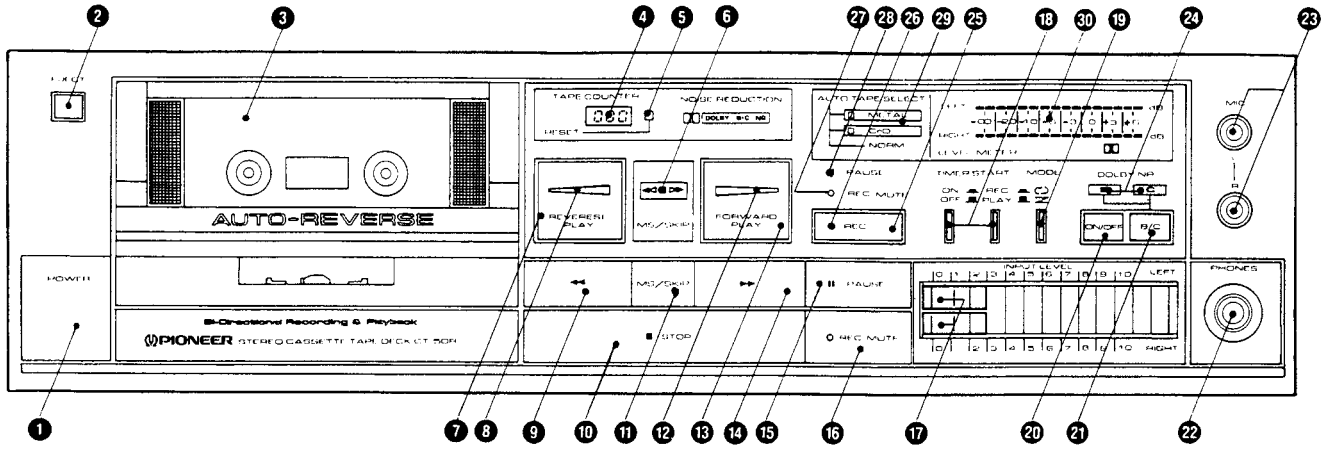
FURNISHED PARTS

Operating instructions 1
Connection cord with pin plug 2

NOTES:
1. Reference Tapes:
Normal and LH: DIN 45513/BLATT6 or equiv.
CrO_2 DIN 45513/BLATT7 (CrO_2) or equiv.
2. Reference Recording Level: Meter 0 dB indicating level (160 nwb/m magnetic level = Philips cassette reference level)
3. Reference Signal: 315 Hz
4. Wow and Flutter: • JIS (3 kHz, with acoustic compensation (weighted) rms value); DIN 3,150Hz with acoustic compensation tion (weighted) PEAK value DIN 45507
5. Frequency Response: • Measured at – 20 dB level, DOLBY NR OFF, level deviation is ± 6 dB without indication.
6. Signal-to-Noise Ratio: • Measured at 3rd harmonic distortion 3% level, weighted (DIN 45513/BLATT7)
7. Sensitivity: Input level (mV) required for reference recording level with input (REC) level control set to maximum
8. Maximum Allowable Input: While decreasing settings of input (REC) level controls and increasing level at input jacks, this is the maximum input level (mV) at the point where recording amplifier OUTPUT waveform becomes clipped.
9. Reference Output Level: Playback output level when meter indicates 0 dB.
10. This model does not employ a recording/playback connector (DIN-type).

NOTE:
Specifications and the design are subject to possible modifications without notice due to improvements.

2. FRONT PANEL FACILITIES



❶ POWER SWITCH

When this switch is pressed, power is turned on. The level meters and the forward indicator or reverse indicator will light. Press the switch again to turn the power off.

- After the switch is set to the ON position, the muting circuit is activated and so the unit will not operate for about 4 seconds.
- When the POWER switch is set to ON while the TIMER START switch is at the ON (■) position, the recording or playback mode is established automatically. Make sure that the TIMER START switch is at OFF (■) when an unattended recording or wake-up playback operation is not to be performed.

❷ EJECT BUTTON (EJECT)

The cassette door opens when this button is depressed.

❸ CASSETTE HOLDER

The cassette holder opens when the EJECT button is depressed. Insert the cassette with the exposed tape side facing down.

❹ TAPE COUNTER

The numbers change as the tape is running. Tape position is indicated with a three-column digital counter.

❺ RESET BUTTON

Depressing this button resets the tape counter to "000".

❻ MUSIC SEARCH/SKIP INDICATOR (ON)

This lights during a music search or skipping operation.

❼ REVERSE PLAY SWITCH

Press this switch to play back or record the reverse side of the cassette tape. When the tape deck is in the forward play mode (tape travelling from left to right) and then this switch is pressed, the tape deck will be switched to the reverse mode (tape travels from right to left).

While in the reverse recording mode, this switch operates when the deck is in standby.

❽ REVERSE INDICATOR

This lights during a reverse mode operation.

❾ REW SWITCH (◄◄)

Press this switch to rewind the tape at high speed (The tape will travel from right to left).

❿ STOP SWITCH (■)

Depress this switch to stop the tape travel and to release the operating switches.

⓫ MS/SKIP SWITCH

When this switch is pressed, the MS/SKIP indicator will light. This tape deck has both the music search function, for locating the unrecorded blank between programs, and the skipping function, for passing over long unrecorded portion quickly.
While this function is activative the tape deck moves like following way in each case.

Music search:

Press the FF switch (►►) or REW switch (◄◄). The unit is automatically set to the playback mode when it locates an unrecorded blank between the programs over 4 seconds long while the tape is being fast forwarded or rewound.

Skip:

In the playback mode, if an unrecorded blank continues on the tape for12seconds or more, the tape deck will switch to the fast forward or rewind mode, until it detects the beginning of the next program. When the next program is detected, the tape deck will switch to the playback mode. This is a convenient feature for listening to tapes with long unrecorded blanks between programs. To release the MUSIC SEARCH/SKIP functions, press this switch once again.

⓬ FORWARD INDICATOR

This lights during a forward mode operation.

⓭ FORWARD PLAY SWITCH

Press this switch to play back or record the forward side of the cassette tape. When the tape deck is in the reverse play mode, and then this switch is pressed, the tape deck will be switched to the forward mode.

While in the reverse recording mode, this switch operates when the deck is in standby.

⓮ FF SWITCH (►►)

Press this switch to send the tape forward at high speed (The tape will travel from left to right).

⓯ PAUSE SWITCH (PAUSE)

Press to temporarily stop the tape transport in the playback or recording mode. At times like this, the pause indicator (■■) lights. When pressed again, the pause function is released and the tape starts to travel again.

*The word "Dolby" and DD are trademarks of Dolby Laboratories Licensing Corporation.
Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

⑯ REC MUTE SWITCH

Use this switch for editing of tapes with proper portion of blanks between the programs and for providing the unrecorded blanks which are required to operate the music search and skipping search functions.

The switch should not be pressed unless absolutely necessary.

⑰ INPUT LEVEL CONTROLS

These controls adjust the input from the rear panel LINE INPUT (REC) terminals or from the MIC jack. When slid toward the right, the recording level is increased; when slid toward the left, it is reduced. The top control is for the left (L) channel and the bottom control for the right (R) channel.

⑱ TIMER START SWITCH

This switch is used when an optional audio timer is employed for unattended recording or wake-up playback operations. Keep this switch at the OFF position when the timer is not being used.

For unattended recording:

When you wish to record a program while you are away from home, etc. ... press the right side and left side switches (ON ▬, REC ▬).

For wake-up program:

When you wish to wake up at the sound of your favorite recorded cassette tape ... Press the left side switch (ON ▬), and release the right side switch (PLAY ▬).

When not using the timer:

Release the left switch to the OFF (▬) position.

⑲ MODE SWITCH

This selects the tape transport mode during playback or recording.

(▬): Auto repeat

This function allows both sides A and B to be repeatedly played back four times each (8 times together). Side A is played back first, this is followed by side B and then side A is played back again, etc. When the tape comes to the end, the auto-stop mechanism is activated and the tape is stopped automatically.

- When the PAUSE switch is pushed during playback to set the unit to the pause mode and then the same switch is released to resume playback, sides A and B of a tape can be played back four times each (8 times together) anew.
- In the case of recording, even if the switch is in the (▬) position, the tape will stop after one full cycle (side A → side B → stops).

(▬): One-way playback (One-way recording)

When the tape is wound up onto one of the reels, the autostop mechanism is activated and the tape is automatically stopped. Set the switch to this position for playing back (recording) one side of a tape.

⑳ *DOLBY NR SWITCH

Press this switch to the ON (▬) position when recording material with the Dolby noise reduction system or when playing back a tape which has been recorded with the system.

㉑ DOLBY B/C SELECTOR SWITCH (B/C)

This deck comes with both type B and type C Dolby noise reduction systems. After the DOLBY NR ON/OFF switch is pressed, select type B or C using this switch. When pressed in (▬), type C is selected; when released (▬), type B is selected.

㉒ HEADPHONES JACK

This is the output jack for the stereo headphones.

㉓ MIC JACKS

These are the input jacks for microphone recording.

㉔ DOLBY INDICATORS (DOLBY NR)

B: This lights when the B type Dolby noise reduction system is operating.
C: This lights when the C type Dolby noise reduction system is operating.

㉕ REC SWITCH

This switch is pressed for recording. When the switch is pressed, the tape deck is placed in the recording standby mode, and the pause indicator (▮▮) and recording indicator (●) will light. To begin recording, press the PAUSE switch to release from the recording standby mode.

NOTE:

- *To release the tape deck from the recording mode, press the STOP switch.*

㉖ RECORDING INDICATOR (●)

This lights when the unit is set to the recording mode.

㉗ RECORDING MUTE INDICATOR (O)

This lights while the REC MUTE switch is pressed during a recording.

㉘ PAUSE INDICATOR (▮▮)

- When the PAUSE switch is pressed during the playback or recording modes, the indicator lights.
- When the REC switch is pressed to place the unit in the recording standby mode, the indicator lights.

㉙ TAPE INDICATORS (CrO_2/METAL)

This mechanism uses the sensor holes on the cassette to detect the type of tape being used. It then automatically adjusts the proper recording bias and equalization for the tape. The type of tape is then shown on the tape indicator.

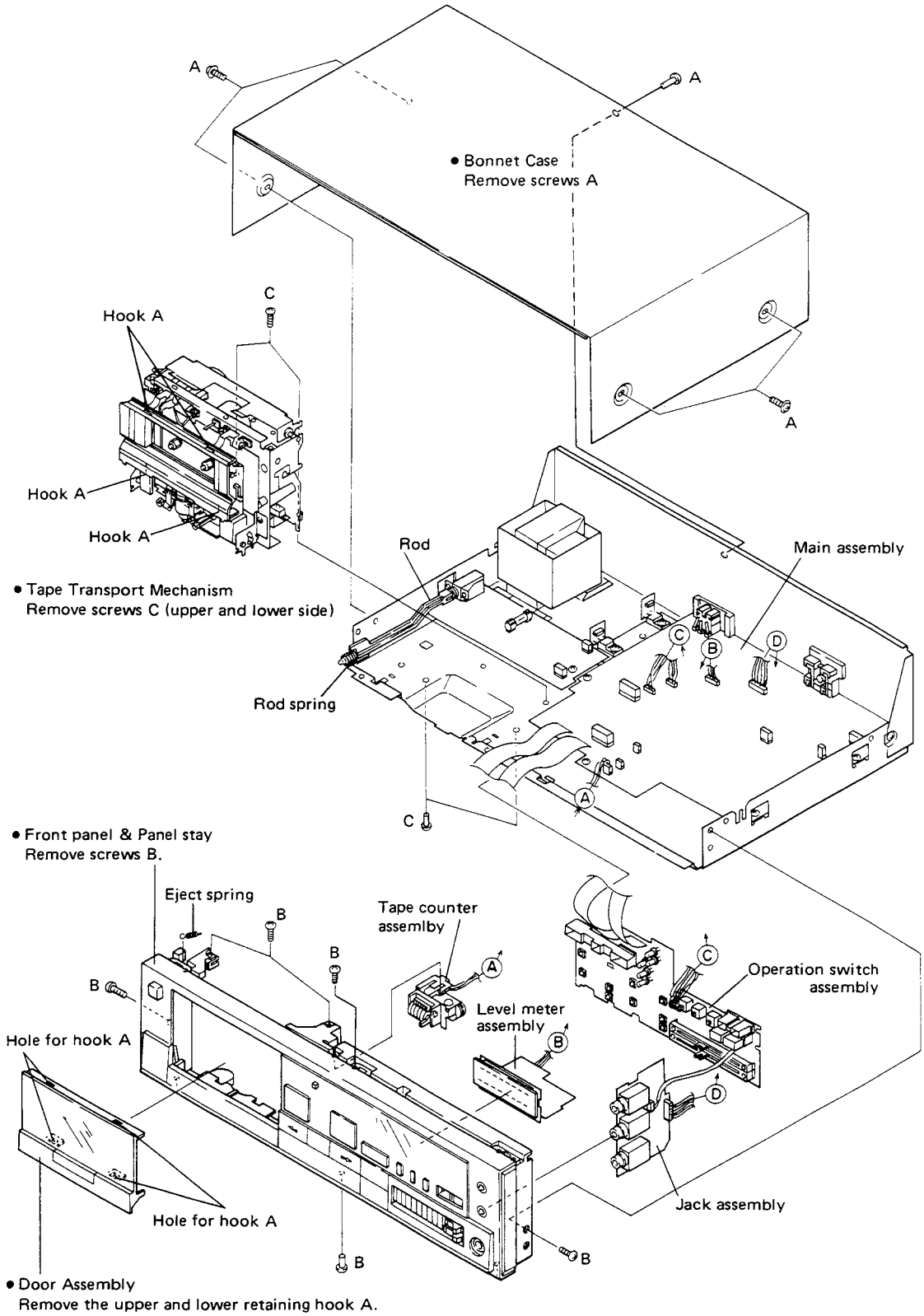
CrO_2: This indicator lights when CrO_2 tapes are used.
METAL: This indicator lights when METAL tapes are used. This indicator also lights when no cassette is loaded.

NOTE:
When the normal tapes are used, the indicator does not light.

㉚ LEVEL METERS

These indicate the input level during recording and the output level during playback.

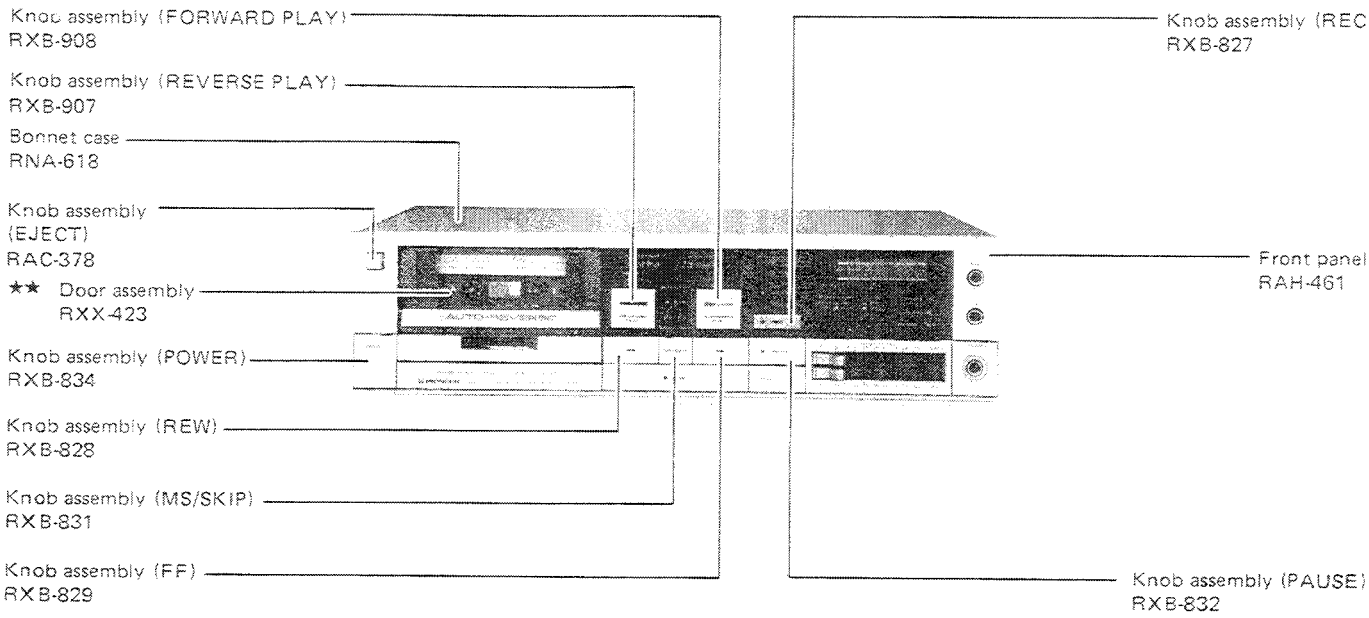
3. DISASSEMBLY



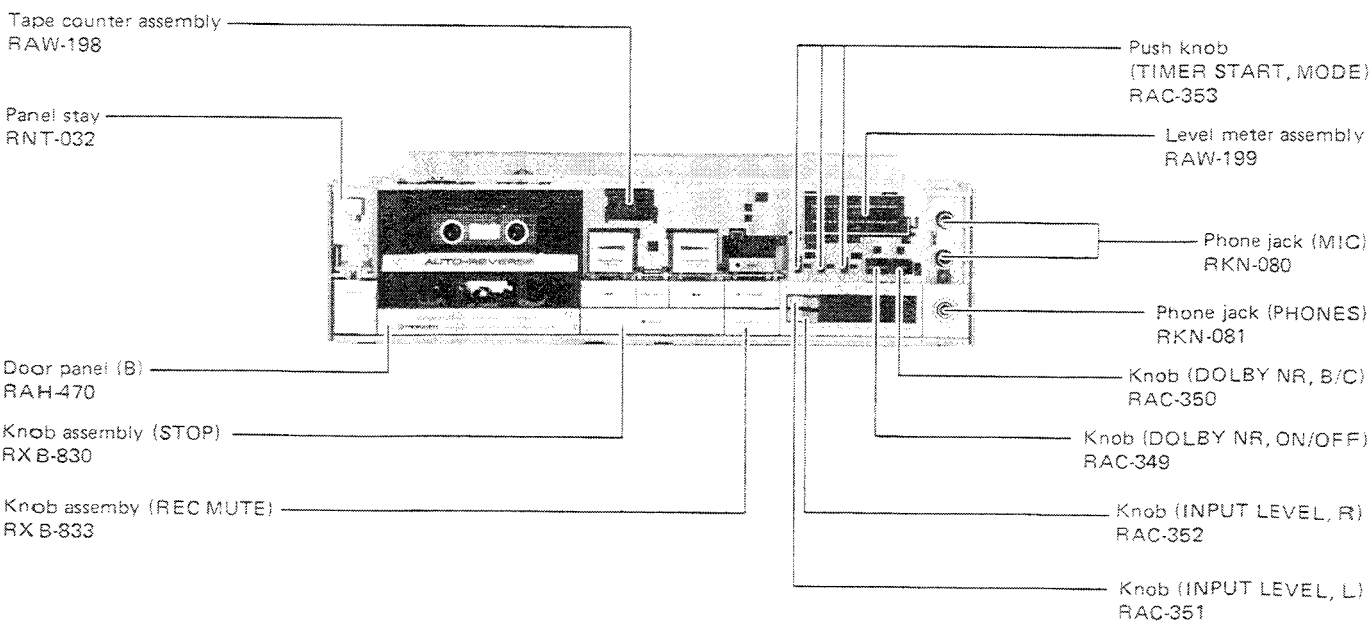
4. PARTS LOCATION

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

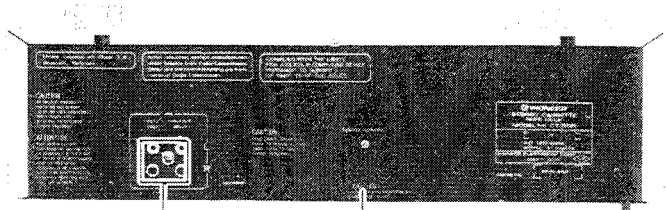
Front Panel View



Front View with Panel Removed



Rear Panel View



Terminal (INPUT/OUTPUT)
RKB-020

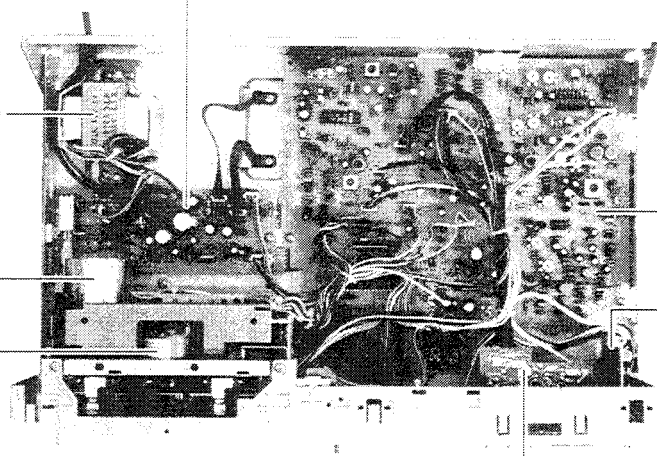
Connector socket (REMOTE)
RKP-840

⚠ AC power cord
RDG-048

Top View

Power supply assembly

⚠ ★ Power transformer (120V)
RTT-339



Main assembly

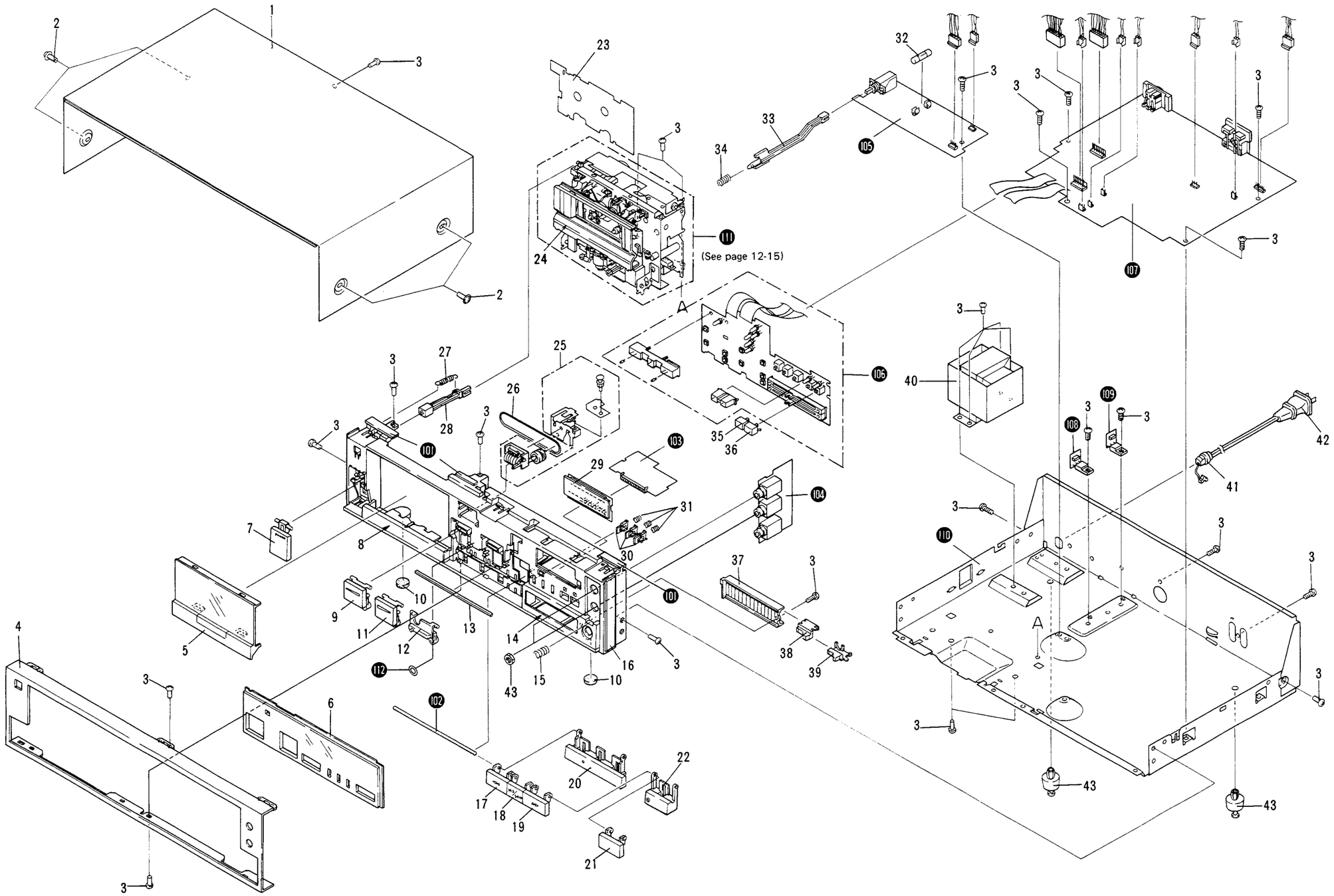
★★ Capstan motor with pulley
RXM-111

Jack assembly

★★ Reel motor with pulley
RXM-112

Meter drive assembly

5. EXPLODED VIEW



Parts List of Exploded View

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
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  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	RNA-618	Bonnet case
	2.	FBT40P080FNI	Screw 4 x 8
	3.	BBZ30P080FMC	Screw 3 x 8
	4.	RAH-461	Front panel
★★	5.	RXX-423	Door assembly
	6.	RAH-474	Indicator panel
	7.	RXB-834	Knob assembly (POWER)
	8.	RAH-470	Door panel (B)
	9.	RXB-907	Knob assembly (REVERSE PLAY)
	10.	REC-355	Stopper
	11.	RXB-908	Knob (FORWARD PLAY)
	12.	RXB-827	Knob assembly (REC)
	13.	REB-499	Cushion
	14.	RAH-468	VR plate
	15.	RBL-051	Spring
	16.	RNT-032	Panel stay
	17.	RXB-828	Knob assembly (REW)
	18.	RXB-831	Knob assembly (MS/SKIP)
	19.	RXB-829	Knob assembly (FF)
	20.	RXB-830	Knob assembly (STOP)
	21.	RXB-832	Knob assembly (PAUSE)
	22.	RXB-833	Knob assembly (REC MUTE)
	23.	RAH-473	Cassette plate
	24.	RAH-472	Pocket panel
	25.	RAW-198	Tape counter assembly
★★	26.	REB-503	Counter belt
	27.	RBL-046	Eject spring
	28.	RAC-378	Knob (EJECT)
	29.	RAW-199	Level meter assembly
	30.	RAC-353	Push knob (TIMER START, MODE)
	31.	RBH-997	Push knob spring
⚠ ★★	32.	REK-074	Fuse (1.6A)
	33.	RNL-681	Rod
	34.	RBH-995	Rod spring
	35.	RAC-349	Knob (DOLBY NR, ON/OFF)
	36.	RAC-350	Knob (DOLBY NR, B/C)
	37.	RNL-674	VR knob guide
	38.	RAC-351	Knob (INPUT LEVEL, L)
	39.	RAC-352	Knob (INPUT LEVEL, R)
⚠ ★	40.	RTT-339	Power transformer (120V)

Mark	No.	Part No.	Description
⚠	41.	REC-395	Strain relief
⚠	42.	RDG-048	AC power cord
	43.	REC-369	Foot assembly
		REC-371	Binder
	43.	RBN-006	Nut
	101.		Mecha cushion
	102.		Shaft
	103.		Meter drive assembly
	104.		Jack assembly
	105.		Power supply assembly
	106.		Operation switch assembly
	107.		Main assembly
	108.		Transistor assembly (A)
	109.		Transistor assembly (B)
	110.		Main chassis
	111.		Tape transport mechanism
	112.		Tape

Parts List of Tape Transport Mechanism

- *Parts without part number cannot be supplied.*
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Mark	No.	Part No.	Description
	1.	RNL-691	Lock plate
	2.	YE20FUC	Washer
	3.	BMZ26P100FMC	Screw 2.6 x 10
★★	4.	RSH-058	Push switch (S102—S104)
★	5.	REB-429	Stopper
	6.	RBH-998	Rod spring
	7.	BBZ26P080FZK	Screw 2.6 x 8
	8.	RBL-001	Lock plate spring
	9.	RNL-690	Eject arm
	10.	YE30FUC	Washer
	11.	RNL-693	Piston
	12.	REB-447	O-ring
	13.	RNL-261	Cylinder
	14.	RNH-285	Half set arm
	15.	RNL-714	Chrome detector arm
	16.	RBL-023	Detector spring
	17.	RNL-715	Metal detector arm
	18.	RLB-515	SW shaft (B)
	19.	RNL-713	REC detector arm
	20.	RBL-022	Half set spring
	21.	RLB-514	SW shaft (A)
	22.	RBL-005	Pinch pressure spring (L)
	23.	RBL-003	Pinch return spring (L)
	24.	YE25FUC	Washer
★★	25.	RXB-858	Pinch arm (L) assembly
	26.	RNL-700	Prism holder
	27.	RNL-698	Guide
	28.	RBL-011	Guide spring (L)
	29.	WA32N060W100	Nylon washer
	30.	RBL-009	Guide arm spring (L)
	31.	YE15FUC	Washer
	32.	RLB-508	Guide shaft
	33.	RBN-009	Nylon nut 3φ
	34.	RNL-699	Prism
	35.	RBK-175	Pocket spring
	36.	RNL-692	Pocket
	37.	RBL-002	Eject spring
	38.	RNR-230	P.C. board
★★	39.	PN-120S	Photo transistor (Q101)
	40.	WA51D080D025	Washer

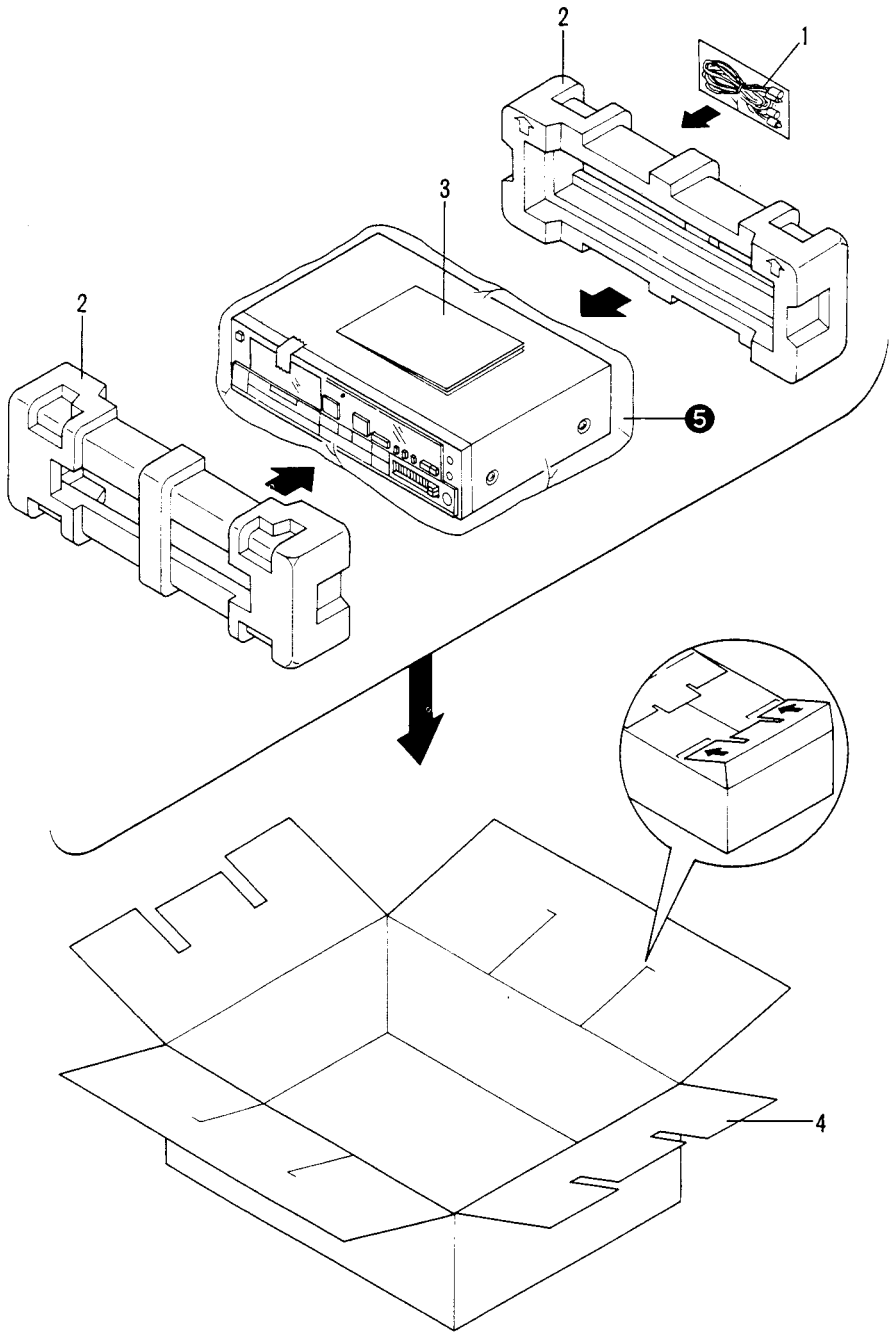
Mark	No.	Part No.	Description
★★	41.	RPB-109	Head assemby (REC/PB & ERASE)
	42.	RBL-008	Gear spring
	43.	RBA-082	Azimuth adjust screw
	44.	WA21B040-010	Washer
	45.	RBH-853	Azimuth adjust spring
	46.	REF-023	Steel ball (4φ)
	47.	BBZ26P060FMC	Screw 2.6 x 6
	48.	RNL-696	Head gear
	49.	RBF-066	Washer
	50.	RBF-057	Washer
	51.	RNL-697	Sector gear
	52.	RXB-862	Housing assembly
	53.	BMZ26P030FMC	Screw 2.6 x 3
	54.	RBL-012	Guide spring (R)
	55.	RBL-010	Guide arm spring (R)
	56.	RBH-999	Return spring
⚠ ★	57.	RXP-154	Plunger solenoid (PLAY)
	58.	RXB-730	Take up idler assembly
	59.	RNL-549	Take up idler
	60.	RBF-065	Washer
	61.	RNR-231	P.C. board
★	62.	LN57-(LF)	LED (D101)
	63.	RBL-048	Head base return spring
	64.	RBA-083	Step screw
	65.	RBK-178	Head base set spring
★★	66.	RXB-860	Reel base assembly
	67.	WA21D040D025	Washer
	68.	RBL-007	Idler spring
	69.	RBF-076	Washer
	70.	RBL-025	Head base spring
	71.	RNL-710	Pinch lever (L)
	72.	RNL-711	Pinch lever (R)
	73.	RBL-021	MS plate spring
	74.	BMZ26P160FMC	Screw 2.6 x 16
★★	75.	RXM-112	Reel motor with pulley
★★	76.	RSG-146	Push switch (S105, S106)
	77.	RBL-013	Change spring
	78.	RBL-019	Brake spring (L)
	79.	RBL-020	Brake spring (R)
	80.	RNL-712	Brake lever

Mark	No.	Part No.	Description
	81.	RNL-709	Plunger solenoid lever
	82.	RNL-708	Trigger lever
	83.	RBL-017	Trigger lever spring
	84.	RXB-853	Holder assembly
	85.	RBF-030	Oil stopper
	86.	WA42D080D50	Washer
	87.	RNL-705	Change arm (L)
	88.	RNL-706	Change arm (R)
	89.	RBL-015	Change arm spring
	90.	RNL-707	Select arm
	91.	RBL-016	Slide plate spring
★★	92.	RXB-859	Pinch arm (R) assembly
	93.	RBL-004	Pinch return spring (R)
	94.	RBL-006	Pinch pressure spring (R)
★★	95.	RXM-111	Capstan motor with pulley
	96.	REB-408	Rubber cushion
	97.	RBA-064	Step screw
★★	98.	REB-500	Capstan belt
	99.	RXB-867	Flywheel assembly L
	100.	RBL-024	Thrust spring
	101.	RBF-059	Washer
	102.	RNL-703	Cam gear
	103.	RBL-014	Drive arm spring
	104.	RXB-865	Drive arm (A) assembly
	105.	RBL-018	Trigger spring
	106.	RNL-704	Drive arm (B)
⚠	★ 107.	RXP-156	Plunger solenoid (DIR)
	108.	RXB-868	Flywheel assembly R
⚠	★ 109.	RXP-155	Plunger solenoid (MS)
★★	110.	RSH-069	Slide switch (S101)
	111.	PMZ20P040FMC	Screw 2 x 4
	112.	RNL-309	Reference pin
	113.	RBF-073	Washer
	114.	BCZ26P080FZK	Screw 2.6 x 8
		REC-371	Binder
	151.		Side plate (L) assembly
	152.		Arm
	153.		Eject prevent lever
	154.		Drive plate (L) assembly
	155.		Guide arm (L)
	156.		Guide arm (R)
	157.		Plate
	158.		SW bracket
	159.		Chassis assembly
	160.		Connector assembly 2P
	161.		Change plate assembly
	162.		Drive plate assembly
	163.		P.C. board
	164.		Connector assembly 2P
	165.		Connector assembly 6P
	166.		MS plate
	167.		Connector assembly 3P
	168.		Reel motor bracket
	169.		Brake plate
	170.		Slide plate

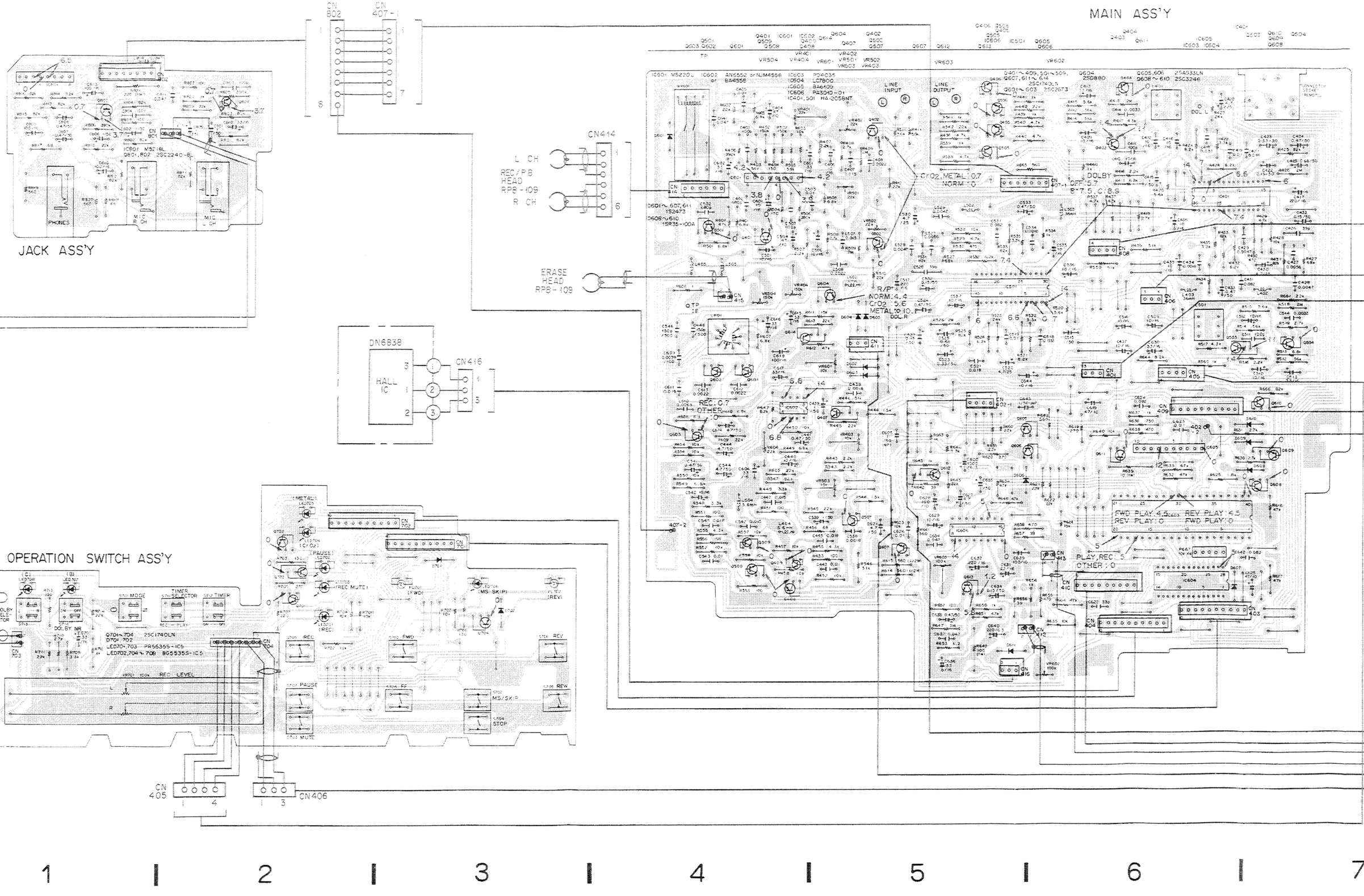
Mark	No.	Part No.	Description
	171.		Drive plate (R) assembly
	172.		Slide plate R
	173.		Holder plate
	174.		Thrust holder
	175.		Solenoid bracket assembly
	176.		Connector socket 9P
	177.		SW holder
	178.		Head base assembly
	179.		Connector socket 10P
	180.		Connector assembly 2P

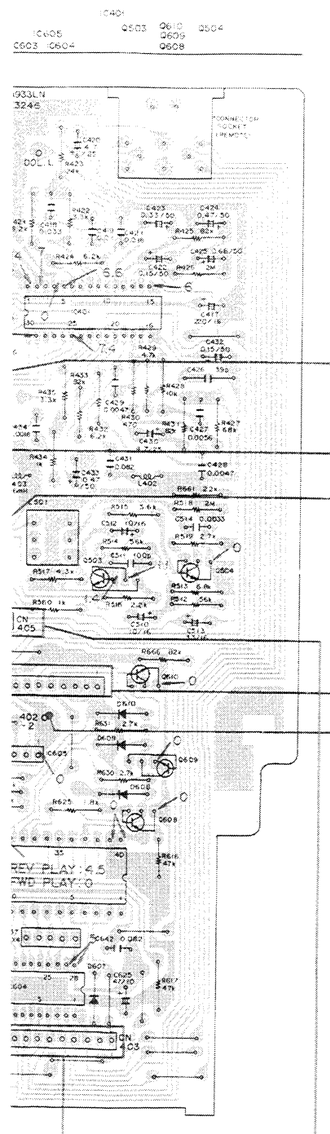
6. PACKING

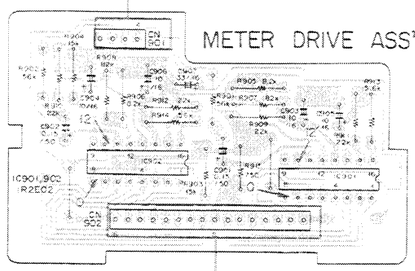
Mark	No.	Part No.	Description
	1.	RDE-010	Connection cord
	2.	RHA-251	Pad
	3.	RRB-221	Operating instructions (English)
	4.	RHG-603	Packing case
	5.		Sheet B

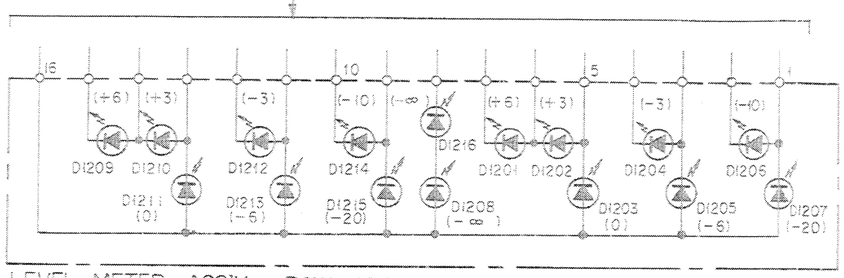


7. P.C.BOARDS CONNECTION DIAGRAM





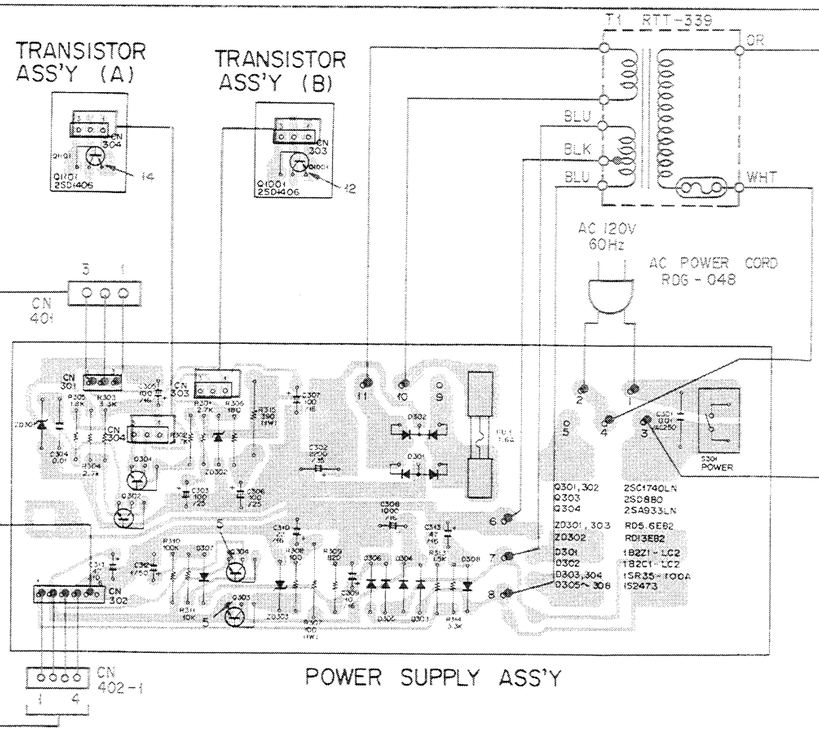




LEVEL METER ASS'Y RAW-199

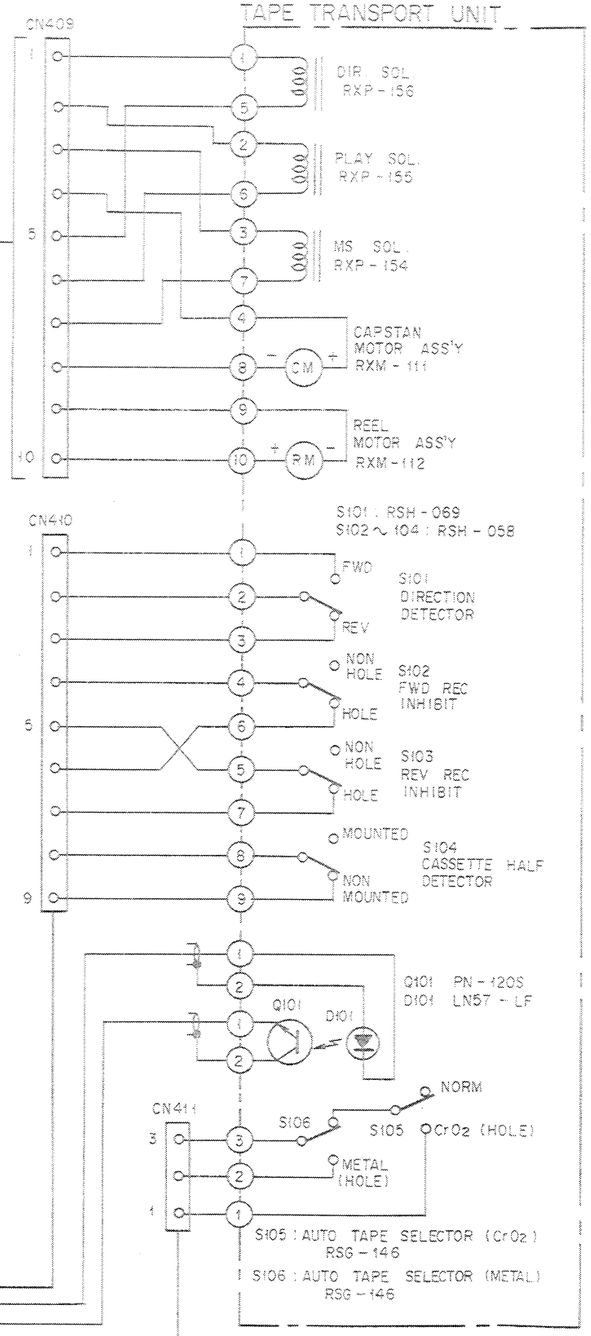
TRANSISTOR ASS'Y (A)

TRANSISTOR ASS'Y (B)

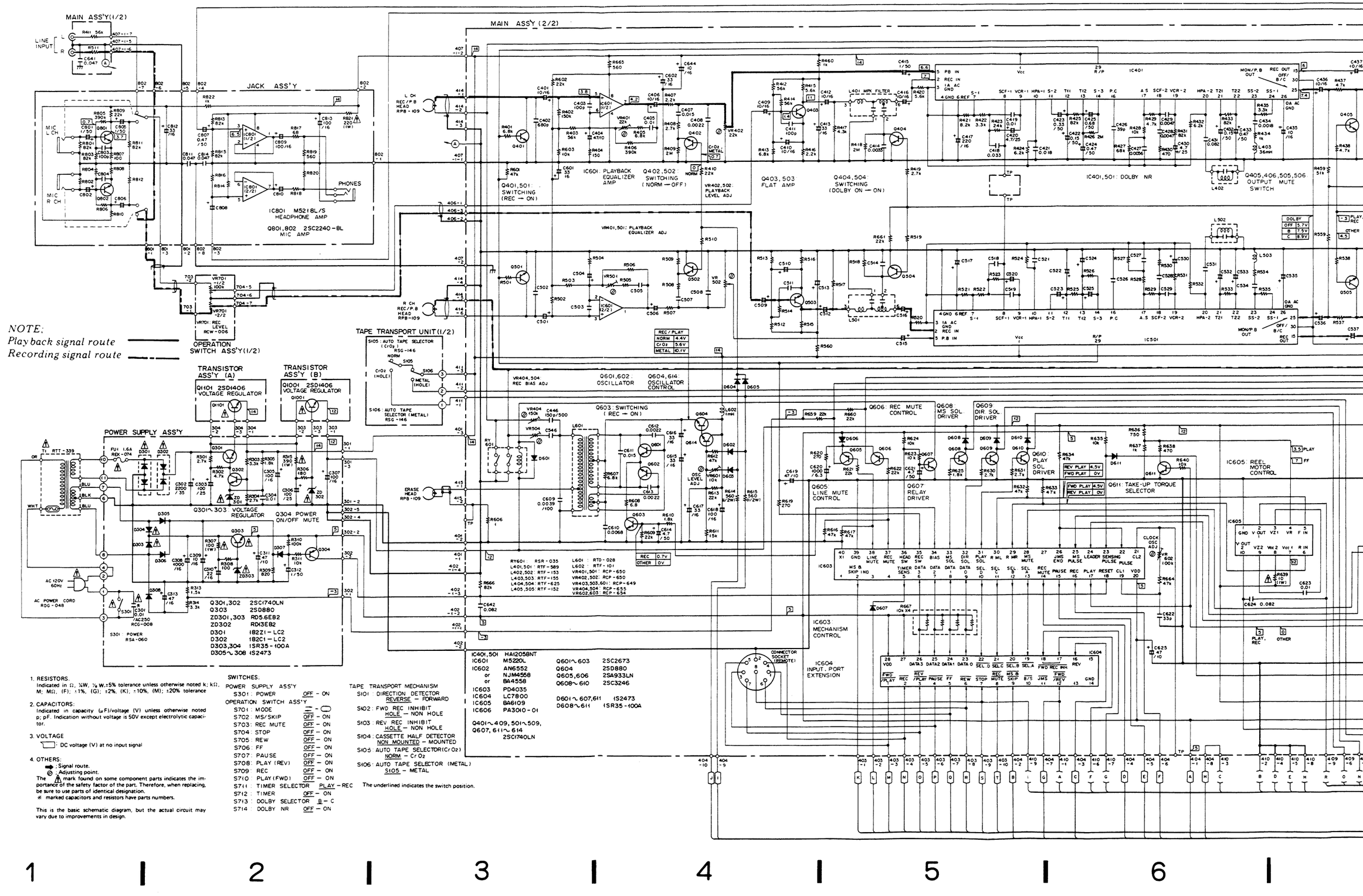


POWER SUPPLY ASS'Y

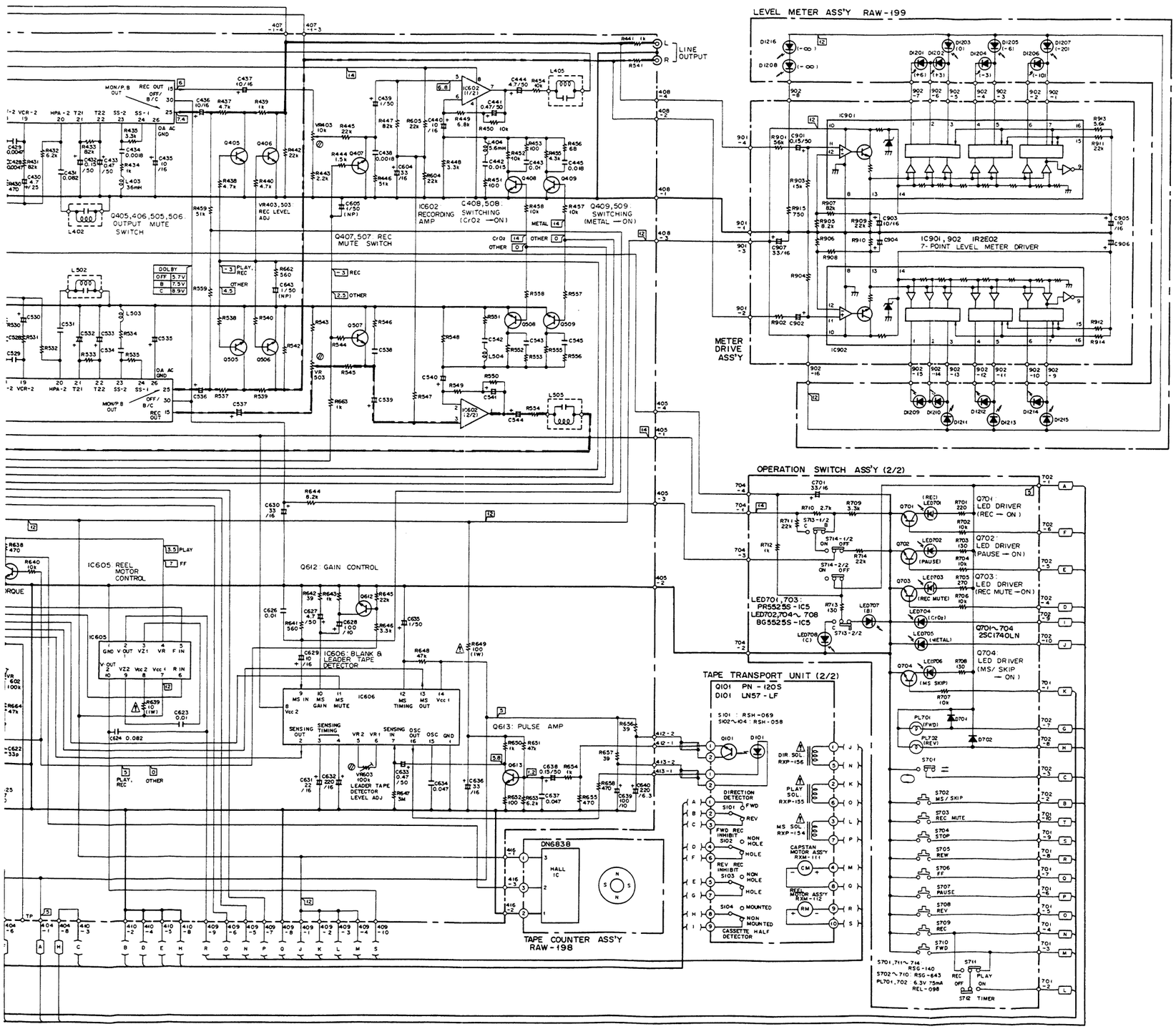
TAPE TRANSPORT UNIT



8. SCHEMATIC DIAGRAM

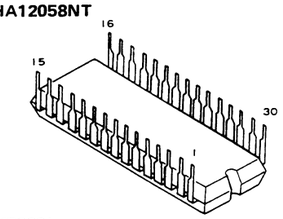

MAIN ASS'Y (1/2)
MAIN ASS'Y (2/2)
JACK ASS'Y
IC801 M5218L/S HEADPHONE AMP
Q801,802 2SC2240-BL MIC AMP
PHONES
OPERATION SWITCH ASS'Y (1/2)
VR701: REC LEVEL RCW-006
TAPE TRANSPORT UNIT (1/2)
S105: AUTO TAPE SELECTOR (CrO2)
S106: AUTO TAPE SELECTOR (METAL)
TRANSISTOR ASS'Y (A)
Q1101 2SD1406 VOLTAGE REGULATOR
TRANSISTOR ASS'Y (B)
Q1001 2SD1406 VOLTAGE REGULATOR
POWER SUPPLY ASS'Y
Q301~303: VOLTAGE REGULATOR
Q304 POWER ON/OFF MUTE
Q301,302 2SC1740LN
Q303 2SD880
ZD301,303 RD5.6EB2
ZD302 RD3EB2
D301 1B221-LC2
D302 1B2C1-LC2
D303,304 1SR35-100A
D305~308 1S2473
IC401,501 HA12058NT
IC601 M5220L
IC602 AN6552 or NJM4558 or BA4558
IC603 PD4035
IC604 LC7800
IC605 BA6109
IC606 PA3010-01
Q401~409,501~509, Q607,611~614 2SC1740LN
Q601~603 2SC2673
Q604 2SD880
Q605,606 2SA933LN
Q608~610 2SC3246
D601~607,611 1S2473
D608~611 1SR35-100A
IC601: PLAYBACK EQUALIZER AMP
Q402,502: SWITCHING (NORM — OFF)
VR402,502: PLAYBACK LEVEL ADJ
Q403,503 FLAT AMP
Q404,504: SWITCHING (DOLBY ON — ON)
IC401,501: DOLBY NR
Q405,406,505,506 OUTPUT MUTE SWITCH
Q401,501: SWITCHING (REC — ON)
VR401,501: PLAYBACK EQUALIZER ADJ
VR404,504: REC BIAS ADJ
Q601,602: OSCILLATOR
Q604,614: OSCILLATOR CONTROL
Q603: SWITCHING (REC — ON)
Q606: REC MUTE CONTROL
Q608 MS SOL DRIVER
Q609 DIR SOL DRIVER
Q610 PLAY SOL DRIVER
Q605 LINE MUTE CONTROL
Q607 RELAY DRIVER
Q611 TAKE-UP TORQUE SELECTOR
IC605: REEL MOTOR CONTROL
IC603: MECHANISM CONTROL
IC604 INPUT. PORT EXTENSION
CONNECTOR SOCKET (REMOTE)
RY601: RSR-035
L401,501: RTF-589
L402,502: RTF-153
L403,503: RTF-155
L404,504: RTF-623
L405,505: RTF-152
L601: RTD-028
L602: RTF-101
VR401,501: RCP-650
VR402,502: RCP-650
VR403,503,601: RCP-549
VR404,504: RCP-655
VR602,603: RCP-654
NOTE:
Play back signal route
Recording signal route
1. RESISTORS.
Indicated in Ω, ¼W, ⅛ W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance
2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE
DC voltage (V) at no input signal
4. OTHERS:
: Signal route.
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
* marked capacitors and resistors have parts numbers.
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.
SWITCHES.
POWER SUPPLY ASS'Y
S301: POWER OFF — ON
OPERATION SWITCH ASS'Y
S701: MODE
S702: MS/SKIP OFF — ON
S703: REC MUTE OFF — ON
S704: STOP OFF — ON
S705: REW OFF — ON
S706: FF OFF — ON
S707: PAUSE OFF — ON
S708: PLAY (REV) OFF — ON
S709: REC OFF — ON
S710: PLAY (FWD) OFF — ON
S711: TIMER SELECTOR PLAY — REC
S712: TIMER OFF — ON
S713: DOLBY SELECTOR B — C
S714: DOLBY NR OFF — ON
TAPE TRANSPORT MECHANISM
S101: DIRECTION DETECTOR REVERSE — FORWARD
S102: FWD REC INHIBIT HOLE — NON HOLE
S103: REV REC INHIBIT HOLE — NON HOLE
S104: CASSETTE HALF DETECTOR NON MOUNTED — MOUNTED
S105: AUTO TAPE SELECTOR (CrO2) NORM — CrO2
S106: AUTO TAPE SELECTOR (METAL) S105 — METAL
The underlined indicates the switch position.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

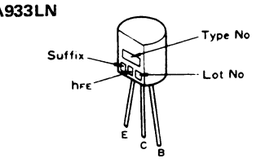


External Appearance of Transistors and ICs

HA12058NT

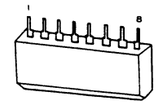


2SC1740LN
2SA933LN

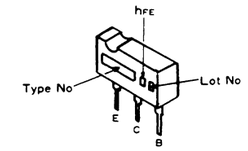


A

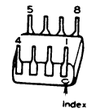
M5220L
M5218L



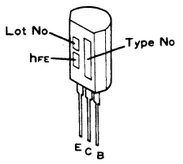
2SC2673-Q



AN6552
NJM4558D
BA4558

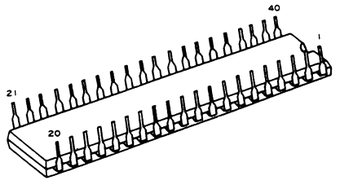


2SC3246

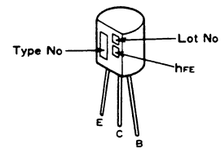


B

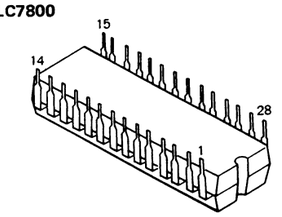
PD4035



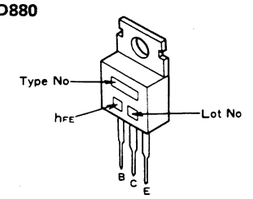
2SC2240-BL



LC7800

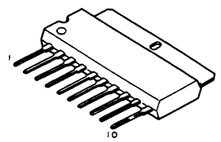


2SD880

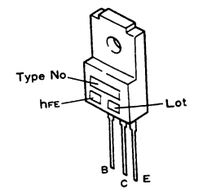


C

BA6109

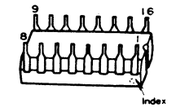


2SD1406



D

PA3010
IR2E02



9. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 x 10^1*	*561*	*RD¼PS* 5610 *J*
47kΩ	*47 x 10^3*	*473*	*RD¼PS* 4733 *J*
0.5Ω	*0R5*		*RN2H* 0R50 *K*
1Ω	*010*		*RS1P* 0100 *K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 x 100*	*5621*	*RN¼SR* 5621 *F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*

  ★★ GENERALLY MOVES FASTER THAN ★.

  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	non supply	Main assembly
	non supply	Operation switch assembly
	non supply	Jack assembly
	non supply	Meter drive assembly
	non supply	Power supply assembly
	non supply	Transistor assembly A
	non supply	Transistor assembly B

OTHERS

Mark	Part No.	Symbol & Description
⚠ ★	RTT-339	T1 Power transformer (120V)
⚠ ★★	REK-074	FU1 Fuse (1.6A)
⚠	RDG-048	AC power cord
	RAW-199	Level meter assembly
	RAW-198	Tape counter assembly
★★	RSH-069	S101 Slide switch
★★	RSH-058	S102–S104 Push switch
★★	RSG-146	S105, S106 Push switch
★★	PN-120S	Q101 Photo transistor
★	LN57-LF	D101 LED
★★	RXM-111	Capstan motor with pulley
★★	RXM-112	Reel motor with pulley
⚠ ★	RXP-154	Plunger solenoid (MS)
⚠ ★	RXP-155	Plunger solenoid (PLAY)
⚠ ★	RXP-156	Plunger solenoid (DIR)
★★	RPB-109	Head assembly (REC/PB & ERASE)

Main Assembly

SEMICONDUCTOR

Mark	Part No.	Symbol & Description
★★	HA12058NT	IC401, IC501
★★	M5220L	IC601
★★	AN6552	IC602
		(NJM4558D)
		(BA4558)
★★	PD4035	IC603
★★	LC7800	IC604
★★	BA6109	IC605
★★	PA3010	IC606
★★	2SC1740LN	Q401–Q409, Q501–Q509, Q607, Q611–Q614
★★	2SC2673-Q	Q601–Q603
★★	2SD880	Q604
★★	2SA933LN	Q605, Q606
★★	2SC3246	Q608–Q610
★	1S2473	D601–D607, D611
★	1SR35-100A	D608–D610

COILS, FILTERS

Mark	Part No.	Symbol & Description
	RTF-589	L401, L501 MPX filter
	RTF-153	L402, L502 Trap coil
	RTF-155	L403, L503 Coil 36mH
	RTF-625	L404, L504 Peaking coil 5.6mH
	RTF-152	L405, L505 Trap coil
	RTD-028	L601 OSC coil
	RTF-101	L602 Line coil

CAPACITORS

Mark	Part No.	Symbol & Description
	CEANL 100M 16	C401, C406, C409, C412, C416, C501, C506, C509, C512, C516
	CEANL 010M 50	C415, C515
	CEANL 470M 10	C404, C504
	CEANL 4R7M 25	C420, C430, C520, C530
	CEA R15M 50	C422, C432, C522, C532, C638
	CEA R33M 50	C423, C523
	CEA R47M 50	C424, C433, C441, C524, C533, C541, C633
	CEA R68M 50	C425, C525
	CEA 010M 50	C439, C539, C635
	CEA 4R7M 50	C444, C544, C614, C621, C627
	CEA 100M 16	C410, C435–C437, C440, C510, C535–C537, C540, C629, C644
	CEA 220M 16	C631
	CEA 330M 16	C413, C513, C601, C602, C604, C615–C617, C630, C636
	CEA 470M 10	C619, C625
	CEA 101M 10	C628, C639
	CEA 101M 16	C618
	CEA 221M 6R3	C640
	CEA 221M 16	C417, C517, C632
	CEA 102M 6R3	C620
	CEANP 010M 50	C605, C643
	CQMA 182K 50	C434, C438, C534, C538
	CQMA 222K 50	C408, C508, C612, C613
	CQMA 332K 50	C414, C514
	CQMA 562K 50	C427, C527
	CQMA 682K 50	C610
	CQMA 472K 50	C428, C429, C528, C529
	CQMA 103K 50	C405, C419, C505, C519, C623, C626
	CQMA 333K 50	C418, C518
	CQMA 473K 50	C634
	CQMA 823K 50	C431, C531, C624, C642
	CCPSL 101J 50	C403, C411, C503, C511
	CCPSL 390J 50	C426, C526
	CCDSL 151K 500	C446, C546
	CKDYF 473Z 50	C637, C641
	CQSA 681K 50	C402, C502
	CQPA 392J 100	C609
	CQMA 103J 50	C443, C543
	CQMA 153J 50	C407, C442, C507, C542, C611
	CQMA 183J 50	C421, C445, C521, C545
	CCDCH 330J 50	C622

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	RCP-650	VR401, VR402, VR501, VR502 Semi-fixed (22k-B)
★	RCP-649	VR403, VR503, VR601 Semi-fixed (10k-B)
★	RCP-655	VR404, VR504 Semi-fixed (150k-B)
★	RCP-654	VR602, VR603 Semi-fixed (100k-B)
	RM4-103J	Resistor array
⚠	RD¼PMF 561J	R614, R615
⚠	RS1LF 100J	R639
⚠	RS1LF 101J	R649
	RD¼PM □□□ JNL	R402, R406, R502, R506
	RD¼PM □□□ J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
	RNH-209	14□ Shield case
	RKP-840	Connector socket (REMOTE)
	RSR-035	Reed relay
	RKB-020	Terminal (INPUT/OUTPUT)

Operation Switch Assembly

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC1740LN	Q701–Q704
★	1S2473	D701, D702
★	PR5525S-1C5	LED701, LED703
★	BG5525S-1C5	LED702, LED704–LED708

SWITCHES

Mark	Part No.	Symbol & Description
★★	RSG-140	S701, S711–S714 Push switch
★★	RSG-643	S702–S710 Push switch

CAPACITOR

Mark	Part No.	Symbol & Description
	CEA 330M 16	C701

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RCW-006	VR701 Variable (INPUT LEVEL)
	RD¼PM □□□ J	All resistors

OTHERS

Mark	Part No.	Symbol & Description
★★	REL-098	PL701, PL702 Lamp (DIRECTION)

Jack Assembly

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	M5218L	IC801
★★	2SC2240-BL	Q801, Q802

CAPACITORS

Mark	Part No.	Symbol & Description
	CEANL 010M 50	C801, C802, C805, C806
	CEA 101M 16	C809, C810, C813
	CEA 330M 16	C812
	CEA R47M 50	C807, C808
	CCPSL 101J 50	C803, C804
	CKDYF 473Z 50	C811, C814

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
⚠	RS1LF 221J	R821
	RD¼PM □□□JNL	R805, R806
	RD¼PM □□□J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
	RKN-080	Phone jack (MIC)
	RKN-081	Phone jack (PHONES)

Meter Drive Assembly

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	IR2E02	IC901, IC902

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA R15M 50	C901, C902
	CEA 100M 16	C903–C906
	CEA 330M 16	C907

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	All resistors

Power Supply Assembly

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC1740LN	Q301, Q302
⚠ ★★	2SD880	Q303
★★	2SA933LN	Q304
⚠ ★★	RD5.6EB2	ZD301, ZD303
⚠ ★	RD13EB2	ZD302
⚠ ★	1B2ZI-LC2	D301
⚠ ★	1B2C1-LC2	D302
⚠ ★	1SR35-100A	D303, D304
	1S2473	D305–D308

SWITCH

Mark	Part No.	Symbol & Description
⚠ ★★	RSA-060	S301 Push switch (POWER)

CAPACITORS

Mark	Part No.	Symbol & Description
⚠	RCG-008	C301 (0.01/AC250)
	CEA 222M 35	C302
	CEA 102M 16	C308
	CEA 101M 25	C303, C306
	CEA 101M 16	C305, C307
	CEA 470M 16	C313
	CEA 470M 10	C311
	CEA 220M 16	C310
	CEA 100M 16	C309
	CEA 010M 50	C312
	CKDYF 103Z 50	C304

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
⚠	RS1LF 391J	R315
⚠	RS1LF 101J	R307
	RD¼PM □□□J	Other resistors

Transistor A Assembly

Mark	Part No.	Symbol & Description
⚠ ★★	2SD1406	Q1101

Transistor B Assembly

Mark	Part No.	Symbol & Description
⚠ ★★	2SD1406	Q1001

10. ADJUSTMENTS

10.1 MECHANICAL ADJUSTMENT

10.1.1 Head Azimuth Preliminary Adjustment

Mode	Adjustment location	Specifications
Stop mode when tape direction is "forward"	Head azimuth adjustment screw ❶	Adjust gap A to 2.2mm.
Stop mode when tape direction is "reverse"	Head azimuth adjustment screw ❷	Adjust gap B to 2.2mm.

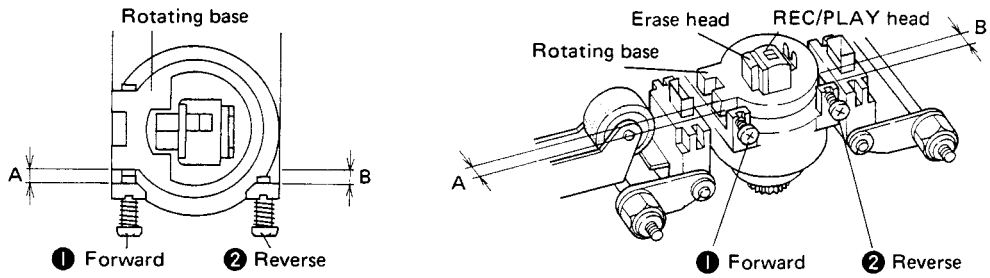


Fig. 10-1 Azimuth preliminary adjustment

10.1.2 Tape Transport Adjustment

Mode	Adjustment location	Specifications
Forward direction playback mode	Adjustment nut ❶	Tape curling at the erase and playback heads must conform with the following figures.
Reverse direction playback mode	Adjustment nut ❷	

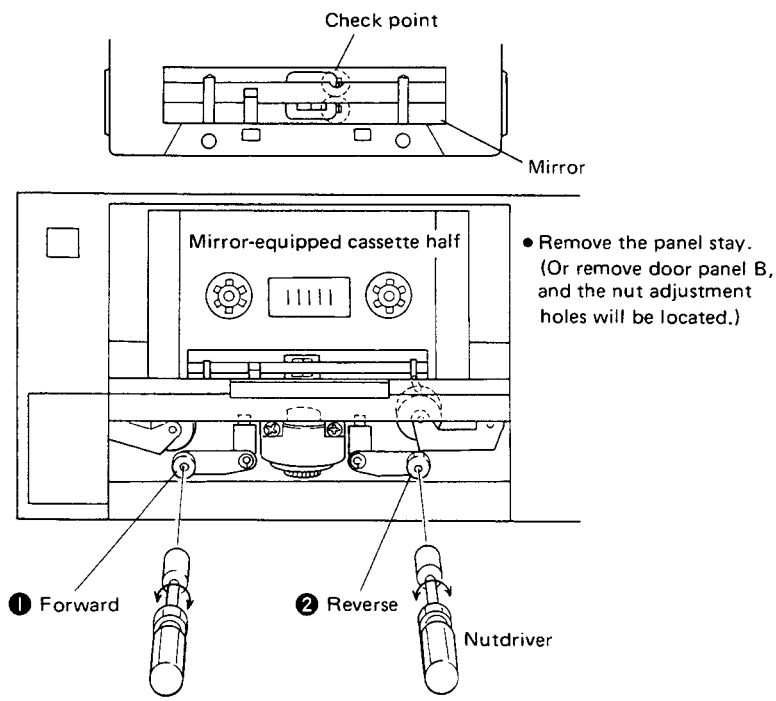

Check point
Mirror
Mirror-equipped cassette half
• Remove the panel stay. (Or remove door panel B, and the nut adjustment holes will be located.)
❶ Forward
❷ Reverse
Nutdriver

Fig. 10-2 Tape transport adjustment

10.1.3 Tape Speed Adjustment

*Use a frequency counter and the STD-301 test tape.

Mode	Adjustment location	Specification
Forward direction playback mode	The variable resistor in the capstan motor adjustment hole.	Playback frequency must be 3005 ±10Hz at the beginning of the STD-301 test tape.
Reverse direction playback mode	Check	Playback frequency must be 3000 ±30Hz at the beginning of the STD-301 test tape.

10.1.4 Cassette Pocket Damper Adjustment

Adjustment location	Specifications
Damper cylinder adjustment screw	The door must open smoothly without going through a two-stage motion, and without any bouncing back when fully opened.

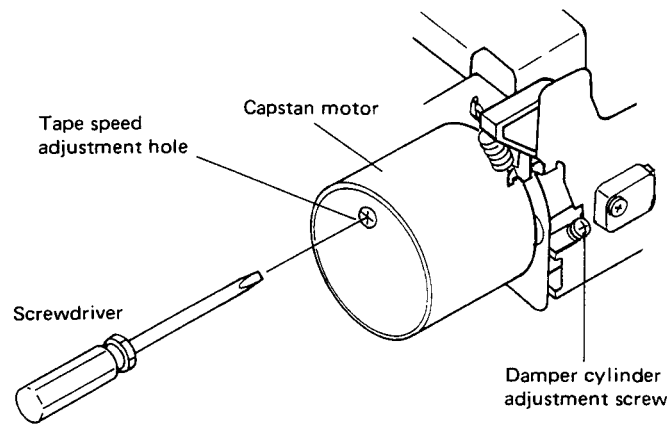


Fig. 10-3 Tape speed and cassette pocket damper adjustment

10.2 ELECTRICAL ADJUSTMENT

- Check the following points before starting any electrical adjustments.

1. All mechanical adjustments must be completed.
2. Clean the heads and demagnetize the REC/PLAYBACK head.
3. Level measurements are based on 0dBv = 1V. Connect a 50kΩ dummy resistor (47k~52kΩ) across the OUTPUT terminals.
4. Use the specified test tapes for each adjustment. Although test tapes have both A and B sides, use the side with the lable (side A).

   STD-331B : Playback adjustments
   STD-608A : NORMAL blank tape
   STD-603 : CrO_2 blank tape
   STD-604 : METAL blank tape

5. Prepare the following measuring equipment. AC millivoltmeter, audio oscillator, attenuator, and oscilloscope.
6. Unless otherwise specified, always adjust for both left and right channels.
7. Unless otherwise specified, adjust with the DOLBY NR switch in the OFF position.
8. Let the deck warm up for a few minutes before starting adjustments. Also leave the deck in playback and recording mode respectively for 3 to 5 minutes before starting playback and recording frequency response adjustments.
9. Proceed according to the specified adjustment sequence. Changing the sequence can prevent proper adjustments from being carried out, and subsequently result in loss of performance.

Adjustment sequence

1. Head azimuth
2. Tape transport
3. Playback equalizer
4. Playback level
5. Erase current
6. Record/playback frequency response
7. Recording level
8. Level meter 0dB check
9. Leader tape detector level
10. Clock frequency

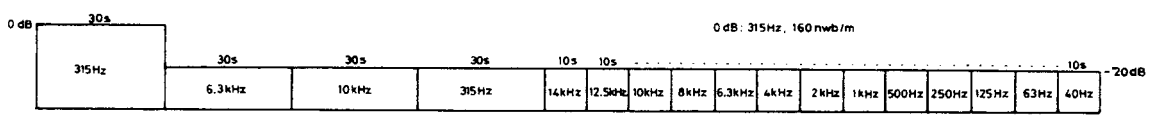


Fig. 10-4 STD-331B test tape

Adjustment control	Adjustment item
VR401, 501	Playback equalizer
VR402, 502	Playback level
VR403, 503	Recording level
VR404, 504	Recording bias
VR601	Erase current
VR602	Timing clock osc.
VR603	Leader tape detector level

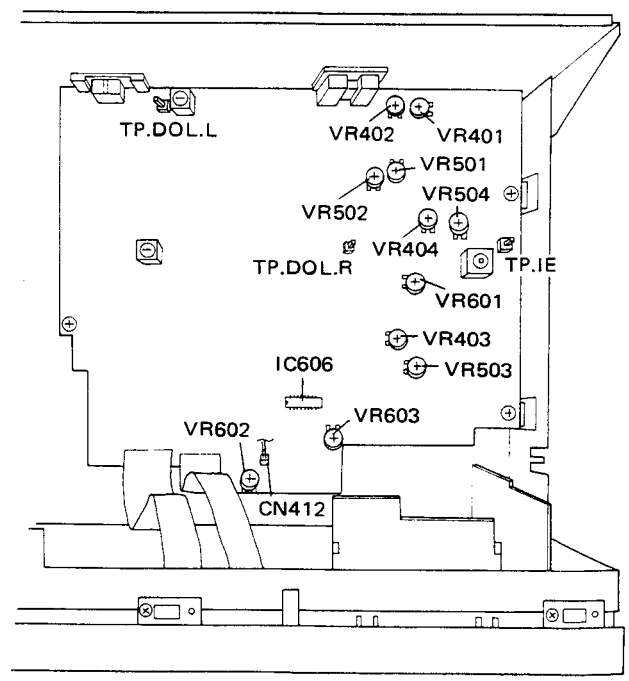


Fig. 10-5 Adjustment locations

1. Head Azimuth Adjustment
- Turn VR402 and VR502 (playback level ADJ) up to maximum position.

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	Playback (forward and reverse)	Play the 10kHz/−20dB portion of the STD-331B test tape.	Head azimuth adjustment screw ① & ② (see Fig. 10-6)	Left and right OUTPUT terminals.	Maximum playback signal level	Screw ① for forward Screw ② for reverse
2	After completing the adjustments up to this stage, secure the azimuth adjustment screw securely into position with "screw lock".					

2. Tape Transport Adjustment
- Use a mirror-equipped cassette half to check the tape transport condition. Adjust if the rated specifications are not met.

	Mode	Input signal & test tape	Adjustment location	Rated specifications	Remarks
1	Playback (forward and reverse)	Mirror-equipped cassette half	Adjustment nuts ① & ② (see Fig. 10-8)	Absence of tape curling at the playback and erase head tape guide during playback mode.	Nut ① for forward Nut ② for reverse

3. Playback Equalizer Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value
1	Forward playback	Play the 315Hz/−20dB and 6.3kHz/−20dB portions of the STD-331B test tape.	VR401 (left ch.) VR501 (right ch.)	Left and right OUTPUT terminals	Adjust the 6.3kHz level to 0dB in respect to the 315Hz playback level.
2	Reverse playback		Check		Check the 6.3kHz level to 0±1.5dB in respect to the 315Hz playback level.
3	See Fig. 10-4 for the permitted playback frequency response zone.				

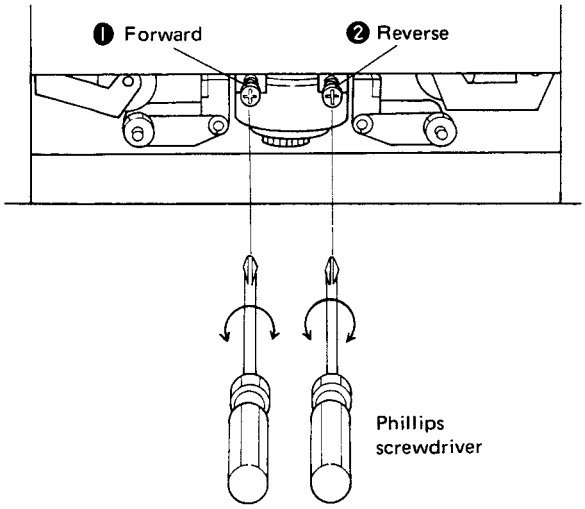


Fig. 10-6 Head azimuth adjustment

Test tape	STD-331B
DOLBY NR switch	OFF

- The right channel signal is compensated by −1dB from the actual 40Hz and 63Hz measured values.

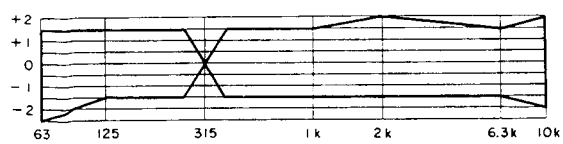


Fig. 10-7 Permitted playback frequency response zone

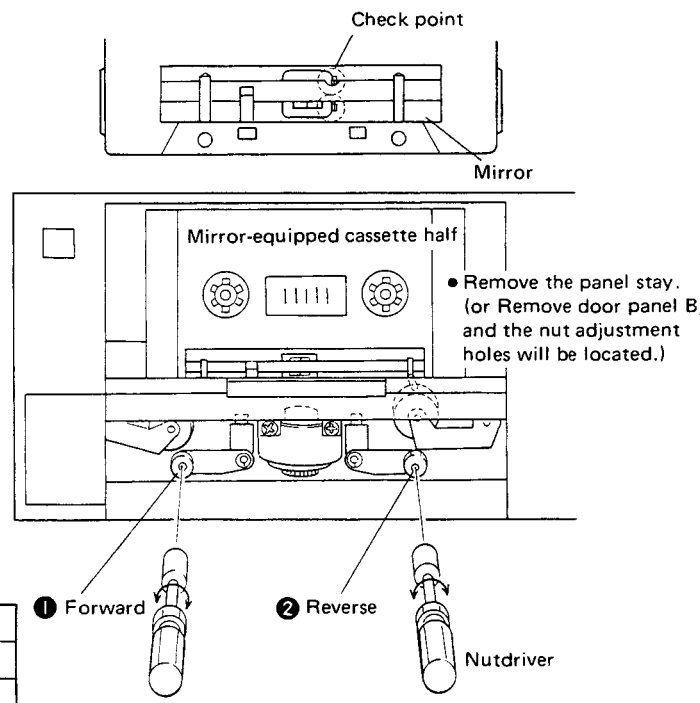

Check point
Mirror
Mirror-equipped cassette half
• Remove the panel stay. (or Remove door panel B, and the nut adjustment holes will be located.)
❶ Forward
❷ Reverse
Nutdriver

Fig. 10-8 Tape transport adjustment

4. Playback Level Adjustment

• Since the playback Dolby level is set by this adjustment, mark sure the adjustments are accurate.

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	
1	Forward playback	Play the 315Hz/0dB portion of the STD-331B test tape.	VR402 (left ch.) VR502 (right ch.)	TP.DOL.L TP.DOL.R	-7.7dBv (412.1mV)	
2	Reverse playback		Check		-7.7dBv±0.5dB	

5. Erase Current Adjustment

	Mode	Input signal & Test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	Recording	Load the STD-604 test tape with no input signal applied.	VR601	TP.IE to ground	160mV	Measure the voltage generated at R606 (1Ω) by the erase current.

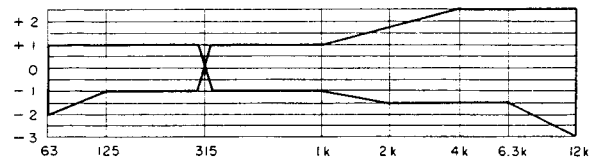
6. Recording/Playback Frequency Response Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	Forward recording/pause	Apply 315Hz/-30dBv to LINE INPUT terminal	INPUT LEVEL control	Left and right OUTPUT terminals	-27dBv (44.7mV)	INPUT LEVEL control position setting.
2	Forward recording/playback	Record 315Hz and 6.3kHz signals on to the STD-608A test tape, and then play those recorded sections.	VR404 (left ch.) VR504 (right ch.)		Repeat the recording and playback, and adjust accordingly until the 6.3kHz playback level is +1.0 dB in respect to the 315Hz signal.	
3	Change the DOLBY NR switch positions, and record 315Hz ~ 12kHz (-30dBv input) on to the STD-608A test tape, and play (forward) the recorded signals back. Check that the playback signals conform with the permitted frequency response zone shown in Fig. 10-9.					
4	Record (reverse) 315Hz ~ 12kHz (-30dBv input) on to the STD-608A test tape, and play (reverse) the recorded signals back. Check that the playback signals conform with the permitted frequency response zone shown in Fig. 10-9.					
5	Change the DOLBY NR switch positions, and record 315Hz ~ 12kHz (-30dBv input) on to the STD-603 test tape, and play the recorded signals back. Check that the playback signals conform with the permitted frequency response zone (for STD-603) shown in Fig. 10-10.					
6	Change the DOLBY NR switch positions, and record 315Hz ~ 12kHz (-30dBv input) on to the STD-604 test tape, and play the recorded signals back. Check that the playback signals conform with the permitted frequency response zone (for STD-604) shown in Fig. 10-11.					

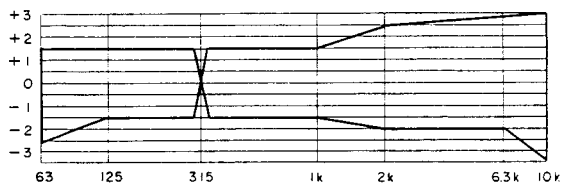
7. Recording Level Adjustment

	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	Recording pause	Apply 315Hz/-10dBv to LINE INPUT terminals	INPUT LEVEL control	TP.DOL.L TP.DOL.R	-7.7dBv (412.1mV)	INPUT LEVEL control position setting.
2	Set the DOLBY NR switch to ON. (DOLBY NR B)					
3	Recording/playback	Record the signal on the STD-608A test tape, and then play that section of the tape.	VR403 (left ch.) VR503 (right ch.)	TP.DOL.L TP.DOL.R	-7.7dBv (412.1mV) (playback level)	Repeat the recording and playback, and adjust accordingly.
4	Recording/playback	Record the signal on the STD-603 test tape, and then play that section of the tape.	Check		-7.7dBv±1.5dB	
5	Recording/playback	Record the signal on the STD-604 test tape, and then play that section of the tape.	Check		-7.7dBv±1.5dB	

Test tape	STD-608A (NORM)
DOLBY NR switch	OFF



Test tape	STD-608A (NORM)
DOLBY NR switch	B type ON



Test tape	STD-608A (NORM)
DOLBY NR switch	C type ON

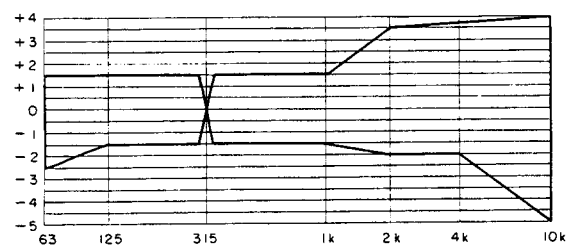
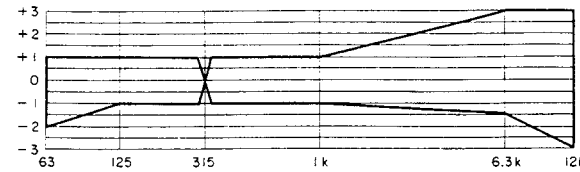
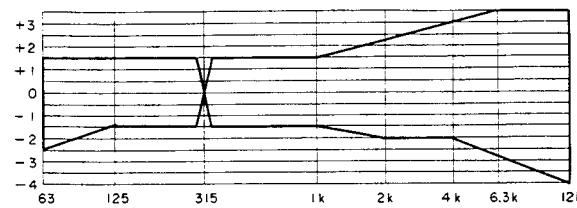


Fig. 10-9 Permitted recording/playback frequency response zone (NORM)

Test tape	STD-603 (CrO_2)
DOLBY NR switch	OFF



Test tape	STD-603 (CrO_2)
DOLBY NR switch	B type ON



Test tape	STD-603 (CrO_2)
DOLBY NR switch	C type ON

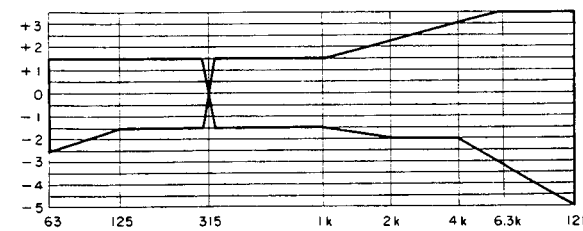
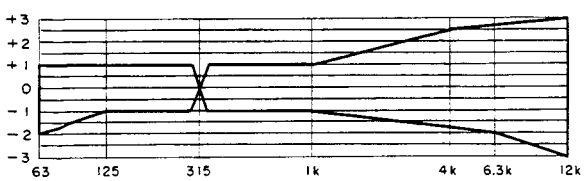
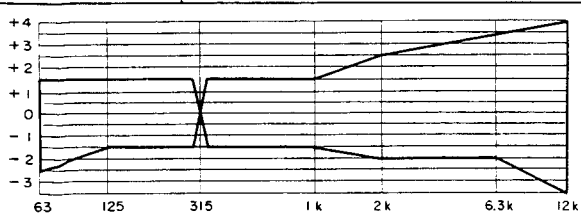


Fig. 10-10 Permitted recording/playback frequency response zone (CrO_2)

Test tape	STD-604 (METAL)
DOLBY NR switch	OFF



Test tape	STD-604 (METAL)
DOLBY NR switch	B type ON



Test tape	STD-604 (METAL)
DOLBY NR switch	C type ON

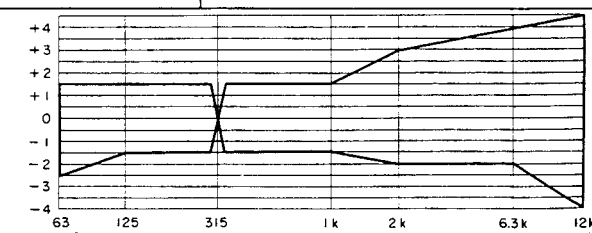


Fig. 10-11 Permitted recording/playback frequency response zone (METAL)

8. Level Meter 0dB Check

	Mode	Input signal & test tape	Adjustment location	Measuring location	Rated specifications
1	Recording pause	Apply 315Hz/−10dBv (316mV) to LINE INPUT	INPUT LEVEL control	TP.DOL.L TP.DOL.R	Check that the level is −7.7dBv ±2dB when the "0" dB display segment light up.

9. Leader Tape Detector Level

	Mode	Input signal & test tape	Adjustment location	Mesuring location	Adjustment value	Remark
1	Disconnect the CN412 connector.					
2	Stop	Apply a 2kHz/−17dBv (0.4Vp-p) signal to the pin 1 of CN412.	VR603	Pin 4 of IC606 (PA3010)	DC7.5V	
3	Reconnect the CN412 connector.					

10. Clock Frequency

	Mode	Input signal & test tape	Ajustment location	Measuring location	Adjustment value	Remark
1	Stop		VR602	Pin 21 of IC603 (PD4035)	200kHz (±5kHz)	Connect the frequency counter to between pin 21 and pin 40 (ground) of IC603 through a capacitor (5 or 6pF)

10. RÉGLAGE

10.1 RÉGLAGES MÉCANIQUES

10.1.1 Réglage préliminaire d'azimut de la tête.

Mode	Emplacement du réglage	Remarques
Mode d'arrêt quand la direction de la bande est vers l'avant.	Vis de réglage d'azimut de tête ❶	Régler l'espace A à 2,2mm.
Mode d'arrêt quand la direction de la bande est inversée.	Vis de réglage d'azimut de tête ❷	Régler l'espace B à 2,2mm.

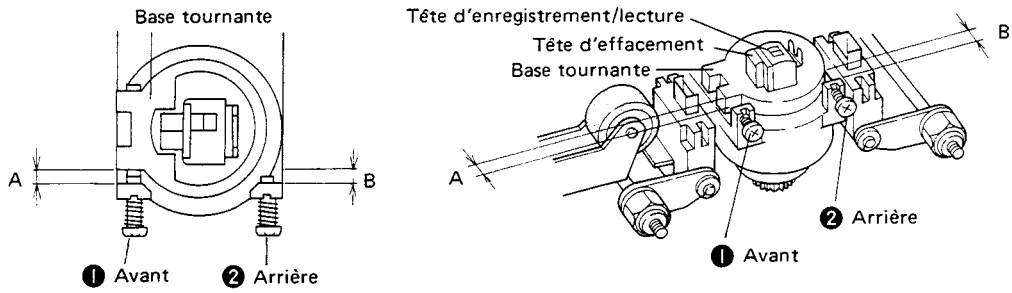


Fig. 10-1 Réglage préliminaire de l'azimut

10.1.2 Réglage du défilement de bande

Mode	Emplacement de réglage	Remarques
Direction vers l'avant en mode de lecture	Ecrou de réglage ❶	La courbure de la bande sur les têtes d'effacement et de lecture doit être conforme aux chiffres suivants.
Direction inverse en mode de lecture	Ecrou de réglage ❷	

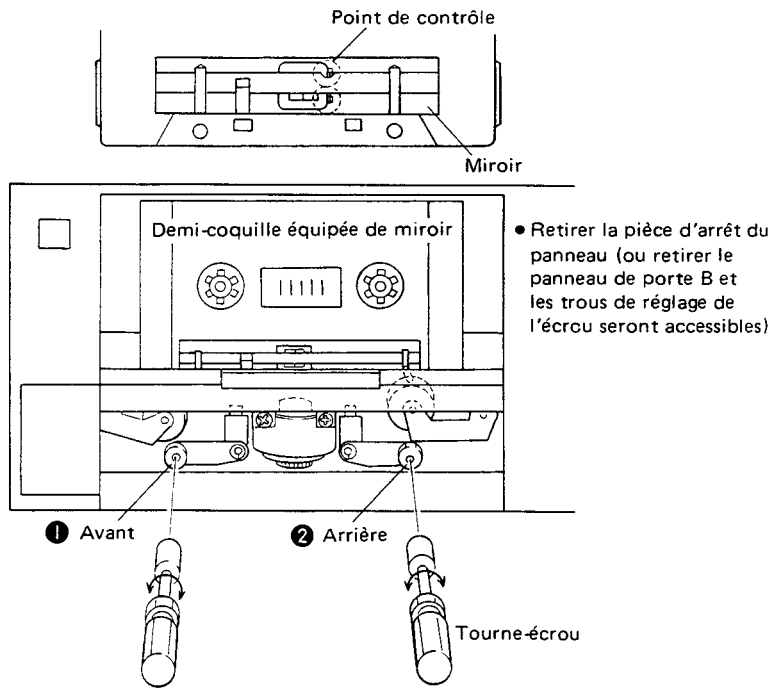

Point de contrôle
Miroir
Demi-coquille équipée de miroir
• Retirer la pièce d'arrêt du panneau (ou retirer le panneau de porte B et les trous de réglage de l'écrou seront accessibles).
❶ Avant
❷ Arrière
Tourne-écrou

Fig. 10-2 Réglage du défilement de bande

10.1.3 Réglage de la vitesse de défilement de la bande

*Utiliser un compteur de fréquence et la bande d'essai STD-301.

Mode	Emplacement de réglage	Remarques
Mode de lecture vers l'avant	Résistance variable dans le trou de réglage du moteur de cabestan.	La fréquence de lecture doit être de 3005±10Hz au début de la bande d'essai STD-301.
Mode de lecture vers l'arrière	Vérification	La fréquence de lecture doit être de 3000±30Hz au début de la bande d'essai STD-301.

10.1.4 Réglage de l'amortisseur de poche de cassette

Emplacement de réglage	Remarques
Vis de réglage du cylindre d'amortisseur	La porte doit s'ouvrir sans accroc, sans passer par un mouvement en deux phases, et sans se refermer violemment lorsqu'elle est grande ouverte.

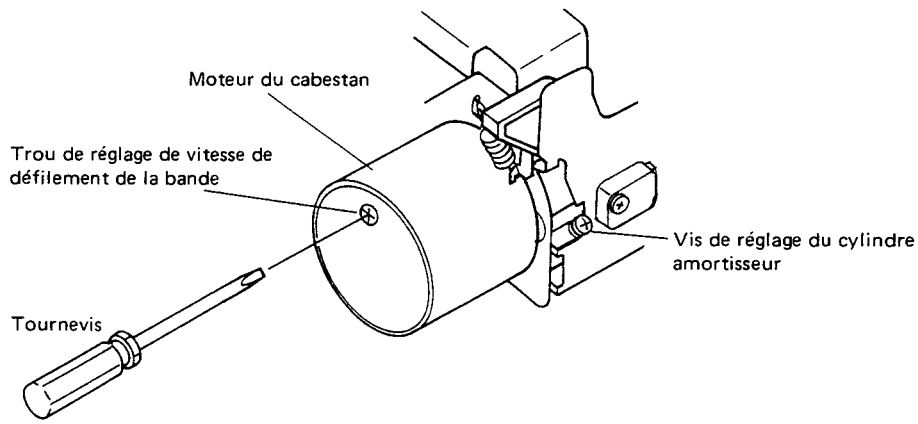

Moteur du cabestan
Trou de réglage de vitesse de défilement de la bande
Vis de réglage du cylindre amortisseur
Tournevis

Fig. 10-3 Réglage de la vitesse du défilement de bande et de l'amortisseur de poche de cassette

10.2 RÉGLAGES ÉLECTRIQUES

- Vérifier les points suivants avant de faire aucun réglage électrique.

1. Tous les réglages mécaniques doivent être terminés.
2. Nettoyer les têtes et démagnétiser la tête d'enregistrement/reproduction.
3. Les mesures de niveau sont basées sur 0dBv = 1V. Brancher une fausse résistance de 50kΩ (47k~52kΩ) sur les bornes de sortie.
4. Utiliser les bandes d'essai spécifiées pour chaque réglage. Bien que ces bandes aient deux côtés, A et B, utiliser le côté identifié par A.

   STD-331B : Réglage de lecture (PLAYBACK)
   STD-608A : Bande vierge NORMALE
   STD-603 : Bande vierge CrO_2
   STD-604 : Bande vierge MÉTAL
5. Préparer les instruments de mesure suivants: Millivoltmètre AC, oscillateur audio, atténuateur et oscilloscope.
6. Sauf indication contraire, régler toujours les canaux droite et gauche.
7. Sauf indication contraire, régler avec le bouton DOLBY NR en position OFF.
8. Laisser chauffer le magnétophone pendant quelques minutes avant de faire un réglage. Également, faire marcher le magnétophone en mode lecture et enregistrement respectivement de 3 à 5 minutes avant d'opérer les réglages de réponse de fréquence de lecture et d'enregistrement.
9. Procéder en suivant la séquence spécifiée de réglage. Un changement dans la séquence peut empêcher un réglage correct d'être fait et peut produire, par la suite, une perte de qualité.

Séquence de réglage

1. Azimut de tête
2. Défilement de bande
3. Egalisation de lecture
4. Niveau de lecture
5. Courant d'effacement
6. Réponse en fréquence d'enregistrement/lecture
7. Niveau d'enregistrement
8. Contrôle du 0dB de l'indicateur de niveau
9. Niveau du détecteur d'amorce de bande
10. Fréquence d'horloge

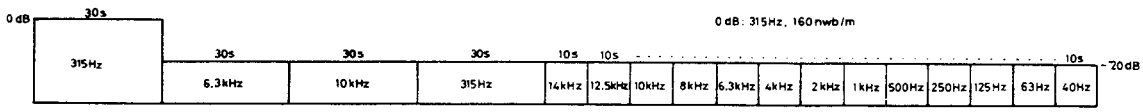


Fig. 10-4 Bande d'essai STD-331B

Contôle de réglage	Pièce de réglage
VR401, 501	Egalisateur de lecture
VR402, 502	Niveau de lecture
VR403, 503	Niveau d'enregistrement
VR404, 504	Polarisation d'enregistrement
VR601	Courant d'effacement
VR602	Oscilateur d'heure
VR603	Niveau de détecteur d'amorce de bande

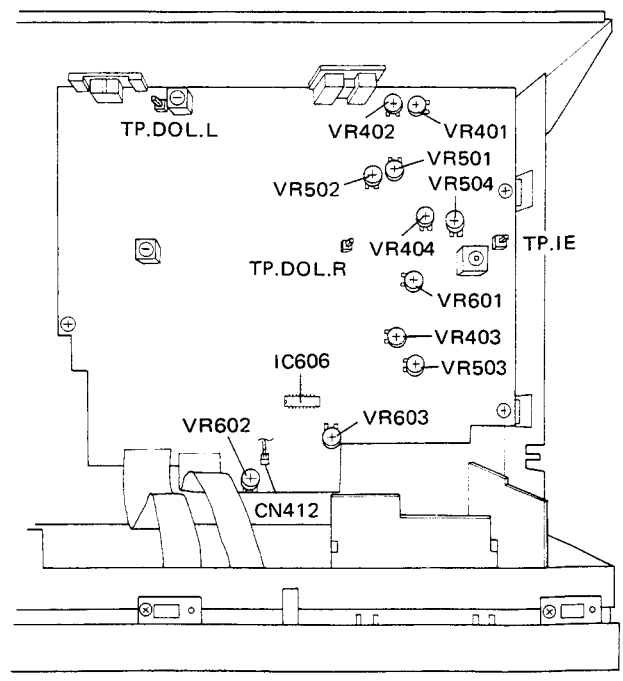


Fig. 10-5 Emplacements de réglage

1. Réglage de l'azimut de tête.
• Tourner VR402 et VR502 (réglage du niveau de lecture (ADJ)) jusqu'à la position maximum.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Valeur de réglage	Remarques
1	Lecture (avant et arrière)	Lire la partie 10kHz/–20dB de la bande d'essai STD-331B.	Vis de réglage d'azimut de tête ① et ② (Voir Fig. 10-6).	Bornes de sortie (OUTPUT) de gauche et de droite.	Niveau du signal de lecture maximum.	Vis ① pour l'avant Vis ② pour l'arrière
2	Après avoir terminé les réglages de cette étape, fixer les vis de réglage d'azimut fermement en place à l'aide du blocage de vis.					

2. Réglage du défilement de bande.
• Utiliser la demi-coquille équipée de miroir pour contrôler l'état du transport de bande. Si les spécifications indiquées ne sont pas obtenues, procéder au réglage.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Spécifications nominales	Remarques
1	Lecture (avant et arrière)	Demi-coquille équipée de miroir.	Ecrous de réglage ① et ② (voir Fig. 10-8).	Absence d'ondulation dans la bande sur le guide de bande de la tête de lecture et d'effacement dans le mode de lecture.	Ecrou ① pour l'avant Ecrou ② pour l'arrière

3. Réglage de l'égalisateur de lecture.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Valeur de réglage
1	Lecture avant	Lire les parties 315Hz/–20dB et 6,3kHz/–20dB de la bande d'essai STD-331B.	VR401 (canal de gauche) VR501 (canal de droite)	Bornes de sortie (OUTPUT) de gauche et de droite.	Ajuster le niveau de 6,3kHz à 0dB par rapport au niveau de lecture à 315Hz.
2	Lecture arrière		Contrôler		Contrôler que le niveau de 6,3kHz soit de 0±1,5dB par rapport au niveau de lecture 315Hz.
3	Voir la Fig 10-4 pour la zone de réponse en fréquence de lecture admise.				

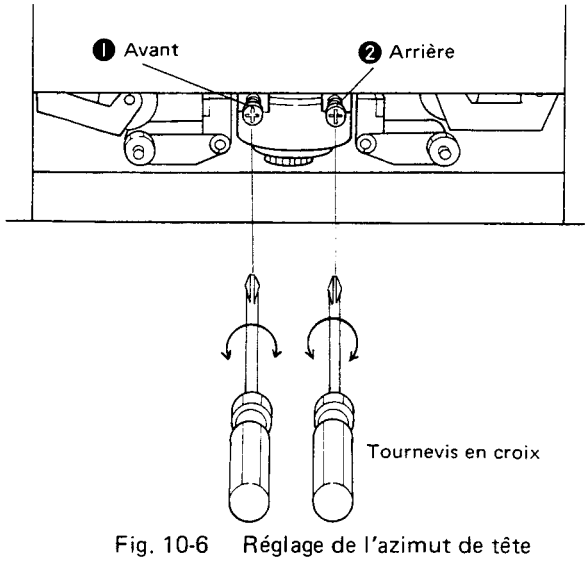


Fig. 10-6 Réglage de l'azimut de tête

Bande d'essai	STD-331B
Commutateur DOLBY NR	OFF

• Le signal du canal droit est compensé par –1dB des valeurs réelles mesurées de 40 et 63Hz.

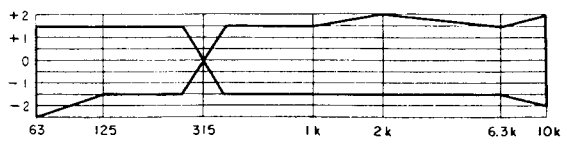


Fig. 10-7 Zone de réponse à la fréquence de lecture permise

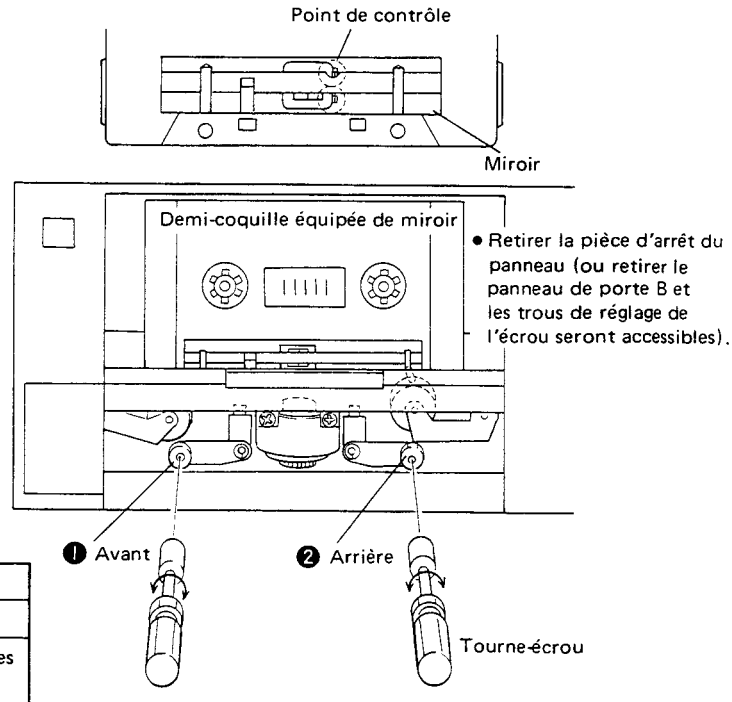

Point de contrôle
Miroir
Demi-coquille équipée de miroir
• Retirer la pièce d'arrêt du panneau (ou retirer le panneau de porte B et les trous de réglage de l'écrou seront accessibles).
❶ Avant
❷ Arrière
Tourne-écrou

Fig. 10-8 Réglage du défilement de bande

4. Réglage du niveau de lecture.

• Le niveau de lecture Dolby étant ajusté par ce réglage, prendre soin de procéder à un réglage précis.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Valeur de réglage
1	Lecture avant	Lire la partie 315Hz/0dB de la bande d'essai STD-331B.	VR402 (canal de gauche) VR502 (canal de droite)	TP.DOL.L TP.DOL.R	−7,7dBv (412,1mV)
2	Lecture arrière		Contrôler		−7,7dB±0,5dB

5. Réglage du courant d'effacement.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Valeur de réglage	Remarques
1	Enregistrement	Charger la bande d'essai STD-604 sans appliquer de signal d'entrée.	VR601	TP.IE à la terre	160mV	Mesurer la tension générée à R606 (1 ohm) par le courant d'effacement.

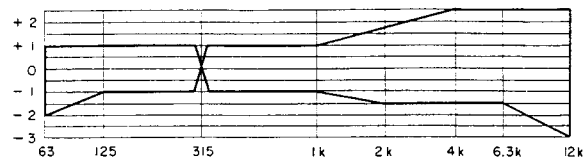
6. Réglage de la réponse en fréquence d'enregistrement lecture.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Valeur de réglage	Remarques
1	Enregistrement avant/pause	Appliquer 315Hz/−30dBv à la borne d'entrée de ligne (LINE INPUT).	Réglage de niveau d'entrée (INPUT LEVEL).	Bornes de sortie (OUTPUT) de gauche et de droite.	−27dBv (44,7mV)	Ajustement de la position de réglage du niveau d'entrée (INPUT LEVEL).
2	Enregistrement avant/lecture	Enregistrer les signaux de 315Hz et de 6,3kHz sur la bande d'essai STD-608A puis lire ces passages enregistrés.	VR404 (canal de gauche) VR504 (canal de droite)		Répéter l'enregistrement et la lecture et ajuster en conséquence jusqu'à ce que le niveau de lecture 6,3 kHz soit de +1,0dB par rapport au signal 315Hz.	
3	Modifier la position du commutateur DOLBY NR et enregistrer 315Hz −12kHz (entrée −30dBv) sur la bande d'essai STD-608A, puis lire les signaux enregistrés (en avant). Contrôler que les signaux de lecture soient conformes à la zone de réponse en fréquence admissible indiquée à la Fig. 10-9.					
4	Enregistrer (en arrière) 315Hz −12kHz (entrée −30dBv) sur la bande d'essai STD-608A et lire les signaux enregistrés (en arrière). Contrôler que les signaux de lecture soient conformes à la zone de réponse en fréquence admissible indiquée à la Fig. 10-9.					
5	Modifier la position du commutateur DOLBY NR et enregistrer 315Hz −12kHz (entrée −30dBv) sur la bande d'essai STD-603 puis lire les signaux enregistrés. Contrôler que les signaux de lecture soient conformes à la zone de réponse en fréquence admissible (pour STD-603) indiquée à la Fig. 10-10.					
6	Modifier la position du commutateur DOLBY NR et enregistrer 315Hz −12kHz (entrée −30dBv) sur la bande d'essai STD-604, puis lire les signaux enregistrés. Contrôler que les signaux de lecture soient conformes à la zone de réponse en fréquence admissible (pour STD-604) indiquée à la Fig. 10-11.					

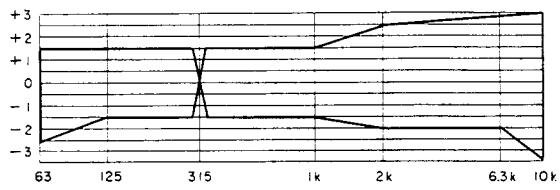
7. Réglage du niveau d'enregistrement.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Valeur de réglage	Remarques
1	Pause à l'enregistrement	Appliquer 315Hz/−10dBv aux bornes d'entrée de ligne (LINE INPUT).	Réglage du niveau d'entrée (INPUT LEVEL).	TP.DOL.L TP.DOL.R	−7,7dBv (412,1mV)	Ajustement de la position du réglage de niveau d'entrée (INPUT LEVEL).
2	Régler le commutateur DOLBY NR sur la position de marche (ON).					
3	Enregistrement/lecture	Enregistrer le signal sur la bande d'essai STD-608A puis lire cette partie de la bande.	VR403 (canal de gauche) VR503 (canal de droite)	TP.DOL.L TP.DOL.R	−7,7dBv (412,1mV) (Niveau de lecture)	Répéter l'enregistrement et la lecture et régler en conséquence.
4	Enregistrement/lecture	Enregistrer le signal sur la bande d'essai STD-603 puis lire cette partie de labande.	Contrôler		−7,7dBv±1,5dB	
5	Enregistrement/lecture	Enregistrer le signal sur la bande d'essai STD-604 puis lire cette partie de la bande.	Contrôler		−7,7dBv±1,5dB	

Bande d'essai	STD-608A(NORM)
Commutateur DOLBY NR	OFF



Bande d'essai	STD-608A(NORM)
Commutateur DOLBY NR	Type B sous tension



Bande d'essai	STD-608A(NORM)
Commutateur DOLBY NR	Type C sous tension

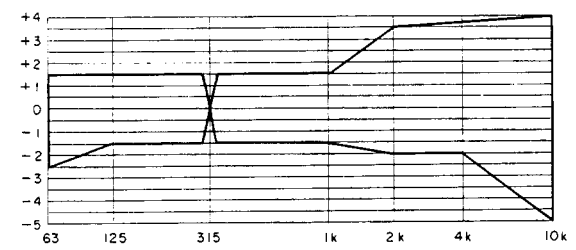
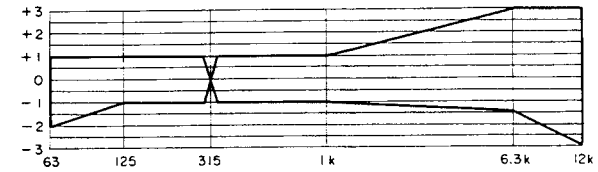
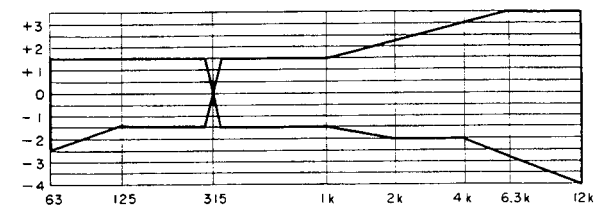


Fig. 10-9 Zone de réponse à la fréquence permise enregistrement/lecture (NORM)

Bande d'essai	STD-603(CrO2)
Commutateur DOLBY NR	OFF



Bande d'essai	STD-603(CrO2)
Commutateur DOLBY NR	Type B sous tension



Bande d'essai	STD-603(CrO2)
Commutateur DOLBY NR	Type C sous tension

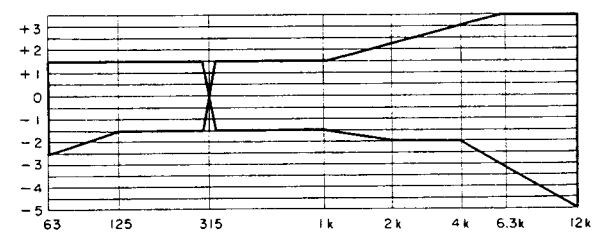
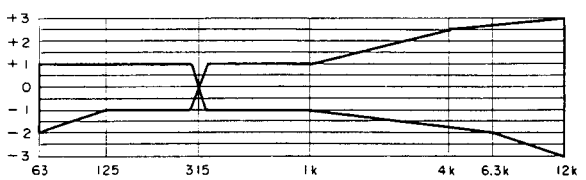
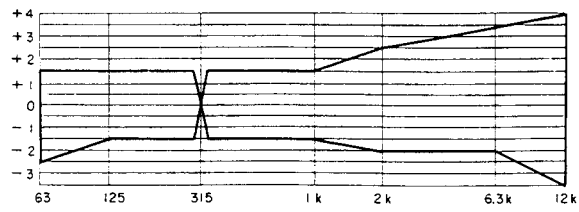


Fig. 10-10 Zone de réponse à la fréquence permise, enregistrement/lecture (CrO_2)

Bande d'essai	STD-604(METAL)
Commutateur DOLBY NR	OFF



Bande d'essai	STD-604(METAL)
Commutateur DOLBY NR	Type B sous tension



Bande d'essai	STD-604(METAL)
Commutateur DOLBY NR	Type C sous tension

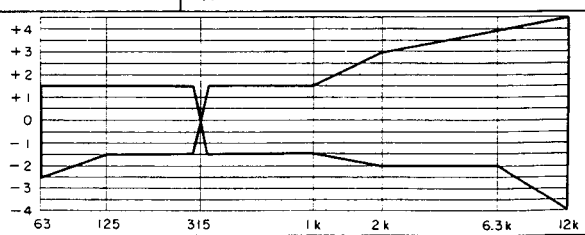


Fig. 10-11 Zone de réponse à la fréquence permise, enregistrement/lecture (métal)

8. Contrôle du 0dB de l'indicateur de niveau.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Spécifications nominales
1	Pause à l'enregistrement	Appliquer 315Hz/–10dBv (316 mV) aux bornes d'entrée de ligne (LINE INPUT).	Commande de niveau d'entrée (INPUT LEVEL)	TP.DOL.L TP.DOL.R	Contrôler que le niveau soit de –7,7dBv ±2dB lorsque le segment d'affichage "0"dB s'allume.

9. Niveau du détecteur d'amorce de bande.

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Valeur de réglage	Remarques
1	Débrancher le connecteur CN412.					
2	Arrêt	Appliquer un signal de 2kHz/ –17dBv (0,4Vc-c) à la broche 1 de CN412.	VR603	Broche 4 de IC606 (PA3010)	7,5Vc-c	
3	Rebrancher le connecteur CN412.					

10. Fréquence d'horloge

	Mode	Signal d'entrée et bande d'essai	Emplacement de réglage	Emplacement de mesure	Valeur de réglage	Remarques
1	Arrêt		VR602	Broche 21 de IC603 (PD4035)	200kHz (±5kHz)	Brancher le conteur de fréquence entre les broches 21 et 40 (terre) de IC603 par le condensateur (5 ou 6pF).

10. AJUSTE

10.1 AJUSTE MECANICO

10.1.1 Ajuste preliminar del acimut de la cabeza

Modo	Lugar de ajuste	Especificaciones
Modo de parada cuando la dirección de la cinta es la de "avance".	Tornillo de ajuste del acimut de la cabeza ❶	Ajustar el entrehierros A a 2,2mm.
Modo de parada cuando la dirección de la cinta es la "inversa"	Tornillo de ajuste del acimut de la cabeza ❷	Ajustar el entrehierros B a 2,2mm.

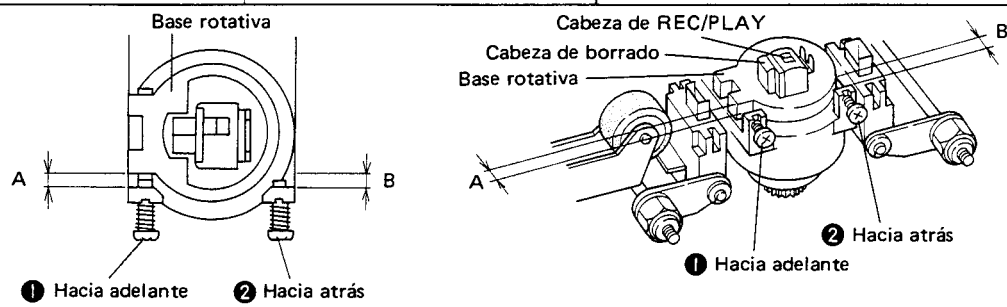


Fig. 10-1 Ajuste preliminar del acimut

10.1.2 Ajuste del transporte de la cinta

Modo	Lugar de ajuste	Especificaciones
Modo de reproducción en la dirección de avance	Tuerca de ajuste ❶	El enhebrado de la cinta en las cabezas de borrado y de reproducción debe conformar las figuras siguientes.
Modo de reproducción en la dirección inversa	Tuerca de ajuste ❷	

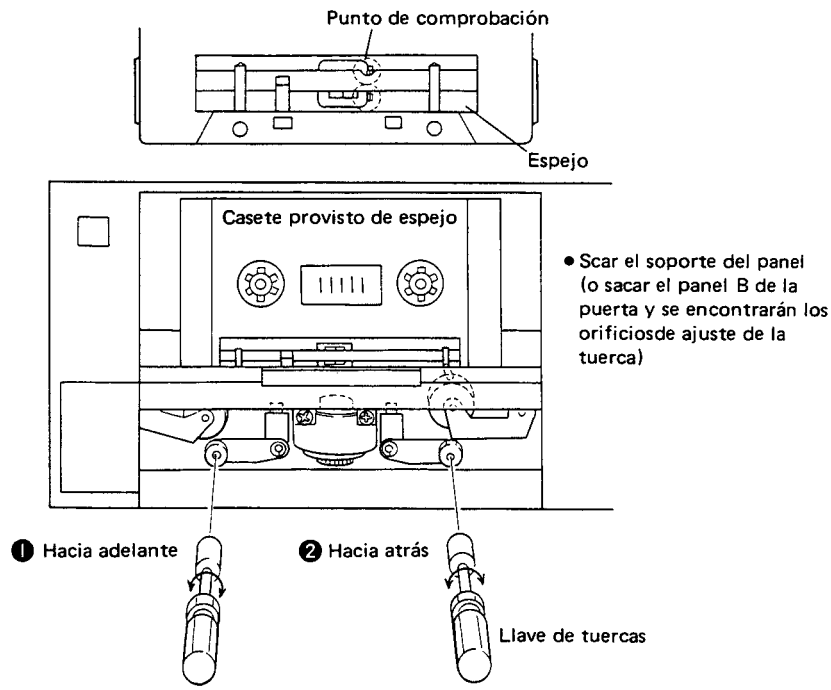

Punto de comprobación
Espejo
Casete provisto de espejo
• Scar el soporte del panel (o sacar el panel B de la puerta y se encontrarán los orificiosde ajuste de la tuerca)
❶ Hacia adelante
❷ Hacia atrás
Llave de tuercas

Fig. 10-2 Ajuste del transporte de la cinta

10.1.3 Ajuste de la velocidad de la cinta

*Emplear un frecuencímetro y la cinta de prueba.

Modo	Lugar de ajuste	Especificación
Modo de reproducción en la dirección de avance	El resistor variable del orificio de ajuste del motor del eje de arrastre.	La frecuencia de reproducción debe ser de 3005±10Hz al principio de la cinta de prueba STD-301.
Modo de reproducción en la dirección inversa	Comprobación	La frecuencia de reproducción debe ser de 3000±30Hz al principio de la cinta de prueba STD-301.

10.1.4 Ajuste del amortiguador del compartimiento del casete

Lugar de ajuste	Especificaciones
Tornillo de ajuste del cilindro del amortiguador	La puerta deberá abrirse suavemente sin pasar por el movimiento de dos etapas y sin rebotar al abrirse por completo.

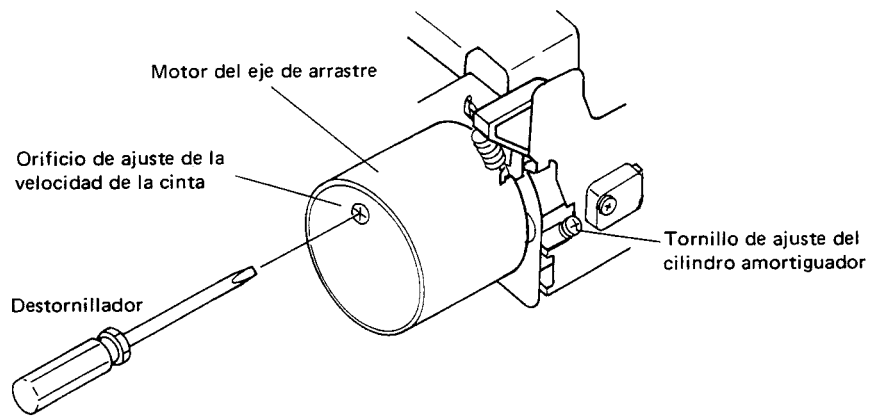

Motor del eje de arrastre
Orificio de ajuste de la velocidad de la cinta
Tornillo de ajuste del cilindro amortiguador
Destornillador

Fig. 10-3 Ajuste de la velocidad de la cinta y del amortiquador del comparfimiento del casete

10.2 AJUSTES ELÉCTRICOS

- Comprobar los puntos siguientes antes de empezar los ajustes eléctricos.

1. Deben estar terminados todos los ajustes mecánicos.
2. Limpiar las cabezas y desmagnetizar la cabeza de grabcíon/reproducción.
3. Las mediciones de nivel se basan en 0dBv = 1V. Conectar un resistor ficticio de 50K ohmios (47K~52K ohmios) entre los terminales de salida (OUTPUT).
4. Emplear las cintas de pruebas especificadas para cada ajuste. Aunque las cintas de pruebas tienen los lados A y B, utilizar el lado de la etiqueta (lado A).
   STD-331B : Ajustes de la reproducción
   STD-608A : Cinta en blanco NORMAL
   STD-603 : Cinta en blanco de CrO_2
   STD-604 : Cinta en blanco de METAL
5. Preparar el siguiente equipo de medición: Un milivoltímetro de CA, oscilador de audio, atenuador, y un osciloscopio.
6. A menos que se especifique lo contrario, ajustar siempre los canales izquierdo y derecho.
7. A menos que se especifique lo contrario, efectuar el ajuste con el interruptor DOLBY NR en la posición OFF.
8. Dejar precalentar el magnetófono durante algunos minutos antes de iniciar los ajustes. Dejar también el magnetófono en los modos de reproducción y de grabación, respectivamente, durante 3 a 5 minutos antes de iniciar los ajustes de la respuesta en frecuencia de reproducción y de grabación.
9. Proceder de acuerdo con la secuencia de ajuste especificada. Si se cambia la secuencia se puede ocasionar el ajuste incorrecto, dando como resultado en una pérdida del rendimiento.

Secuencia de ajuste

1. Acimut de la cabeza
2. Transporte de la cinta
3. Ecualizador de reproducción
4. Nivel de reproducción
5. Corriente de borrado
6. Respuesta en frecuencia de grabación/reproducción
7. Nivel de grabación
8. Comprobación de 0dB del medidor de nivel
9. Nivel detector de cinta guía
10. Frecuencia de reloj

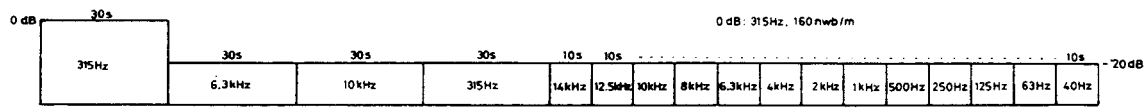


Fig. 10-4 Cinta de prueba STD-331B

Control de ajuste	Item de ajuste
VR401, 501	Ecualizador de reproducción
VR402, 502	Nivel de reproducción
VR403, 503	Nivel de grabación
VR404, 504	Polarización de grabación
VR601	Corriente de borrado
VR602	Oscilador de hora
VR603	Nivel de detector de cinta guía

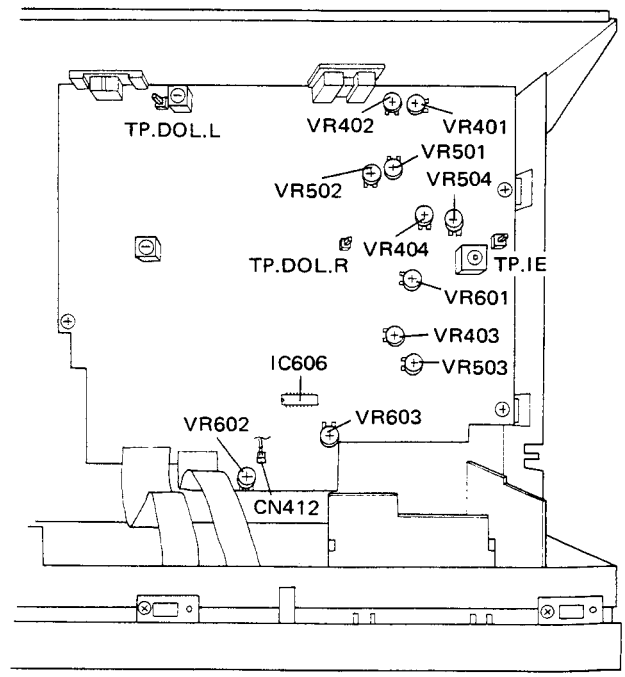


Fig. 10-5 Lugares de ajuste

1. Ajuste del acimut de la cabeza.
• Girar VR402 y VR502 (ADJ del nivel de reproducción) a la posición máxima.

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1	Reproducción (hacia adelante y atrás)	Reproducir la parte de 10kHz/ −20dB de la cinta de prueba STD-331B.	Tornillo ① y ② de ajuste del acimut de la cabeza (ver la Fig. 10-6).	Terminales OUTPUT izquierdo y derecho.	Nivel máximo de la señal de reproducción.	Tornillo ① para hacia adelante Tornillo ② para hacia atrás.
2	Después de completar el ajuste hasta aquí, fijar bien el tornillo de ajuste del acimut en su posición con "enclavamiento del tornillo".					

2. Ajuste del transporte de la cinta.
• Emplear un casete provisto de espejo para comprobar el estado del transporte de la cinta. Ajustarlo si no se satisfacen las especificaciones nominales.

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Especificaciones nominales	Observaciones
1	Reproducción (hacia adelante y atrás)	Casete provisto de espejo.	Tuercas ① y ② de ajuste (ver la Fig. 10-8).	Ausencia de bucle de cinta en la guía de la cinta de la cabeza de reproducción y de borrado durante la reproducción.	Tuerca ① para hacia adelante Tuerca ② para hacia atrás

3. Ajuste del ecualizador de reproducción.

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste
1	Reproducción hacia adelante	Reproducir las de 315Hz/−20dB y 6,3kHz/−20dB de la cinta de prueba STD-331B.	VR401 (canal izq.) VR501 (canal der.)	Terminales OUTPUT izquierdo y derecho.	Ajustar el nivel de 6,3kHz a 0dB con respecto al nivel de reproducción de 315Hz.
2	Reproducción hacia atrás		Comprobar		Comprobar el nivel de 6,3kHz a 0±1,5dB con respecto al nivel de reproducción de 315Hz.
3	Ver la Fig. 10-4 para la zona permitida de respuesta en frecuencia de reproducción.				

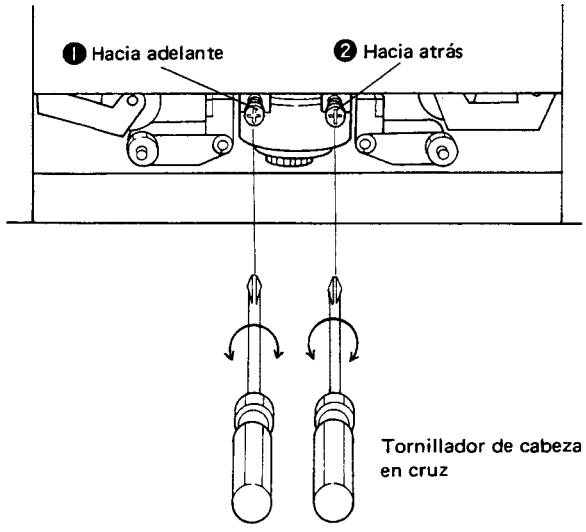


Fig. 10-6 Ajuste del acimut de la cabeza

Cinta de prueba	STD-331B
Interruptor DOLBY NR.	OFF

• La señal del canal derecho se compensa en −1dB desde los valores medidos reales de 40Hz y 63Hz.

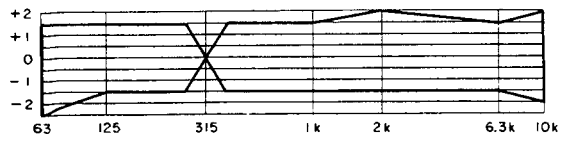


Fig. 10-7 Zona de respuesta en frecuencia de reproducción permitida

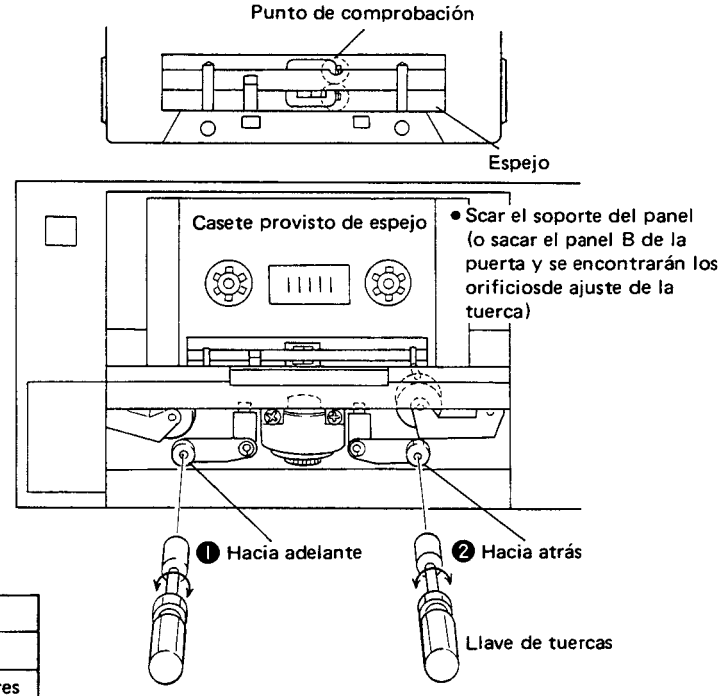

Punto de comprobación
Espejo
Casete provisto de espejo
• Scar el soporte del panel (o sacar el panel B de la puerta y se encontrarán los orificiosde ajuste de la tuerca)
❶ Hacia adelante
❷ Hacia atrás
Llave de tuercas

Fig. 10-8 Ajuste del transporte de la cinta

4. Ajuste del nivel de reproducción.

• Puesto que el nivel Dolby de reproducción se establece con este ajuste, cerciorarse de que los ajustes sea precisos.

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste
1	Reproducción hacia adelante	Reproducir la parte de 315Hz/ 0dB de la cinta de prueba STD-331B.	VR402 (canal izq.) VR502 (canal der.)	TP.DOL.L TP.DOL.R	−7,7dBv (412,1mV)
2	Reproducción hacia atrás		Comprobar		−7,7dB±0,5dBv

5. Ajuste de la corriente de borrado.

	Modo	Señal de entrada y cinta de prueba	Luga de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1	Grabación	Cargar la cinta de preuba STD-604 sin aplicar ninguna señal de entrada.	VR601	TP.IE a masa	160mV	Medir la tensión generada en R606 (1 ohmio) mediante la corriente de borrado.

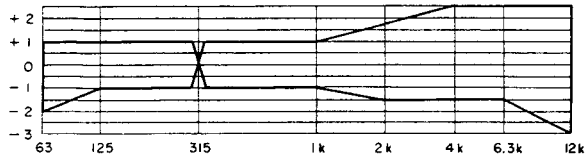
6. Ajuste de la respuesta en frecuencia de grabación/reproducción.

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1	Grabación hacia adelante/pausa	Aplicar 315Hz/−30dBv al terminal LINE INPUT.	Control INPUT LEVEL.	Terminales izquierdo y derecho OUTPUT.	−27dBv (44,7mV)	Ajuste de la posición del control INPUT LEVEL.
2	Grabación/reproducción hacia adelante	Grabar las señales de 315Hz y 6,3kHz en la cinta de prueba STD-608A, y reproducir luego estas partes.	VR404 (canal izq.) VR504 (canal der.)		Repetir la grabación y reproducción, y ajustar consecuentemente hasta que el nivel de reproducción de 6,3kHz sea +1,0dB con respecto a la señal de 315Hz.	
3	Cambiar las posiciones del interruptor DOLBY NR, y grabar 315Hz −12kHz (entrada de −30dBv) en la cinta de prueba STD-608A, y reproducir (hacia adelante) las señales grabadas. Comprobar que las señales de reproducción conformen la zona permitida de respuesta en frecuencia mostrada en la Fig. 10-9.					
4	Grabar (hacia atrás) 315Hz −12kHz (entrada de −30dBv) en la cinta de prueba STD-608A, y reproducir (hacia atrás) las señales grabadas. Comprobar que las señales de reproducción conformen la zona permitida de respuesta en frecuencia mostrada en la Fig. 10-9.					
5	Cambiar las posiciones del interruptor DOLBY NR, y grabar 315Hz −12kHz (entrada de −30dBv) en la cinta de prueba STD-603, y reproducir las señales grabadas. Comprobar que las señales de reproducción conformen la zona permitida de respuesta en frecuencia mostrada en la Fig. 10-10 (para la STD-603).					
6	Cambiar las posiciones del interruptor DOLBY NR, y grabar 315Hz −12kHz (entrada de −30dBv) en la cinta de prueba STD-604, y reproducir las señales grabadas. Comprobar que las señales de reproducción conformen la zona permitida de respuesta en frecuencia mostrada en la Fig. 10-11 (para la STD-604).					

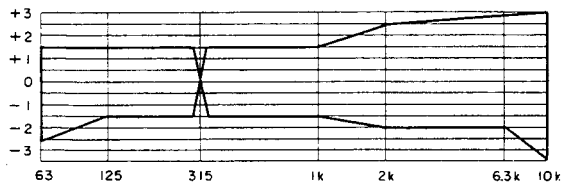
7. Ajuste del nivel de grabación.

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1	Pausa en grabación	Aplicar 315Hz/−10dBv a los terminales LINE INPUT.	Control INPUT LEVEL.	TP.DOL.L TP.DOL.R	−7,7dBv (412,1mV)	Ajuste de la posición del control INPUT LEVEL.
2	Poner el interruptor DOLBY NR en la posición ON.					
3	Grabación/ reproducción	Grabar la señal en la cinta de prueba STD-608A, y reproducir luego esta parte de la cinta.	VR403 (canal izq.) VR503 (canal der.)	TP.DOL.L TP.DOL.R	−7,7dBv (412,1mV) (nivel de reproducción)	Repetir la grabación y reproducción y ajustar consecuentemente.
4	Grabación/ reproducción	Grabar la señal en la cinta de prueba STD-603, y reproducir luego esta parte de la cinta.	Comprobar		−7,7dBv±1,5dB	
5	Grabación/ reproducción	Grabar la señal en la cinta de prueba STD-604, y reproducir luego esta parte de la cinta.	Comprobar		−7,7dBv±1,5dB	

Cinta de prueba	STD-608A(NORM)
Interruptor DOLBY NR	OFF



Cinta de prueba	STD-608A(NORM)
Interruptor DOLBY NR	Tipo B ON



Cinta de prueba	STD-608A(NORM)
Interruptor DOLBY NR	Tipo C ON

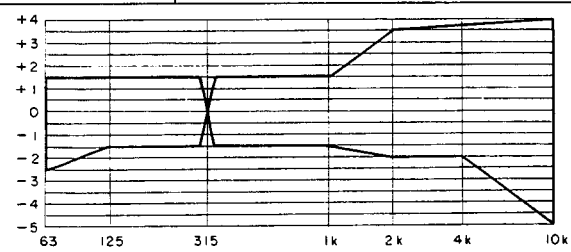
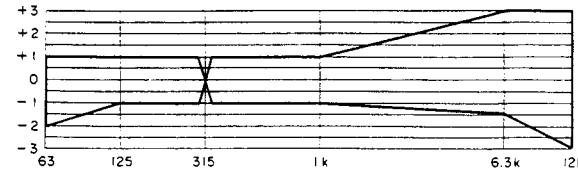
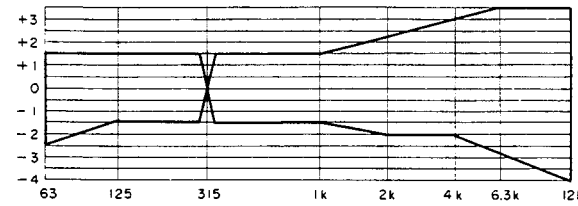


Fig. 10-9 Zona de respuesta en frecuencia permitida para grabación/reproducción (NORM)

Cinta de prueba	STD-603(CrO_2)
Interruptor DOLBY NR	OFF



Cinta de prueba	STD-603(CrO_2)
Interruptor DOLBY NR	Tipo B ON



Cinta de prueba	STD-603(CrO_2)
Interruptor DOLBY NR	Tipo C ON

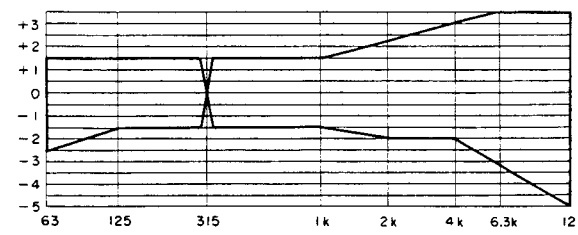
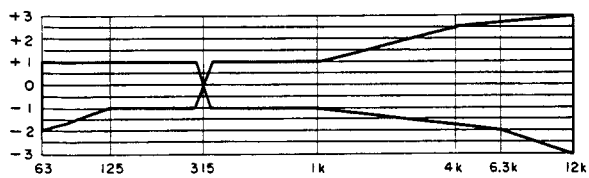
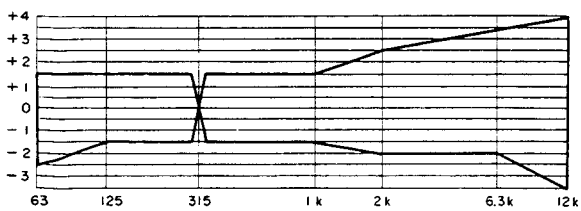


Fig. 10-10 Zona de respuesta en frecuencia permitida para grabación/reproducción (CrO_2)

Cinta de prueba	STD-604(METAL)
Interruptor DOLBY NR	OFF



Cinta de prueba	STD-604(METAL)
Interruptor DOLBY NR	Tipo B ON



Cinta de prueba	STD-604(METAL)
Interruptor DOLBY NR	Tipo C ON

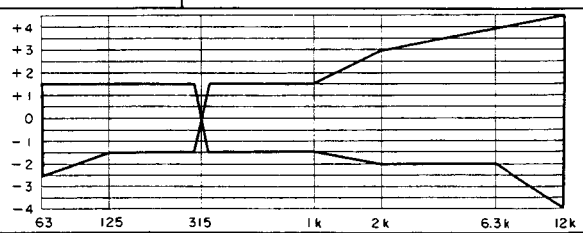


Fig. 10-11 Zona de respuesta en frecuencia permitida para grabación/reproducción (METAL)

8. Comprobación de 0dB del medidor de nivel.

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Especificaciones nominales
1	Pausa en grabación	Aplicar 315Hz/–10dBv (316mV) a los terminales LINE INPUT.	Control INPUT LEVEL.	TP.DOL.L TP.DOL.R	Comprobar que el nivel sea de –7,7dBv ±2dB cuando se ilumina el segmento del indicador de "0" dB.

9. Nivel detector de cinta guía.

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1	Desconectar el conector CN412.					
2	Parada	Aplicar una señal de 2kHz/–17 dBv (0,4Vp-p) a la patilla 1 de CN412.	VR603	Patilla 4 de IC606 (PA3010)	7,5V CC	
3	Valver a conectar el conector CN412.					

10. Frecuencia de reloj

	Modo	Señal de entrada y cinta de prueba	Lugar de ajuste	Lugar de medición	Valor de ajuste	Observaciones
1	Parada		VR602	Patilla 21 de IC603 (PD4035)	200kHz (±5kHz)	Conectar el mostrador de frecuencia en medio de los patillas 21 y 40 (tierra) de IC603 por el condensador.

11. SUPPLEMENT FOR D AND D/G TYPES

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

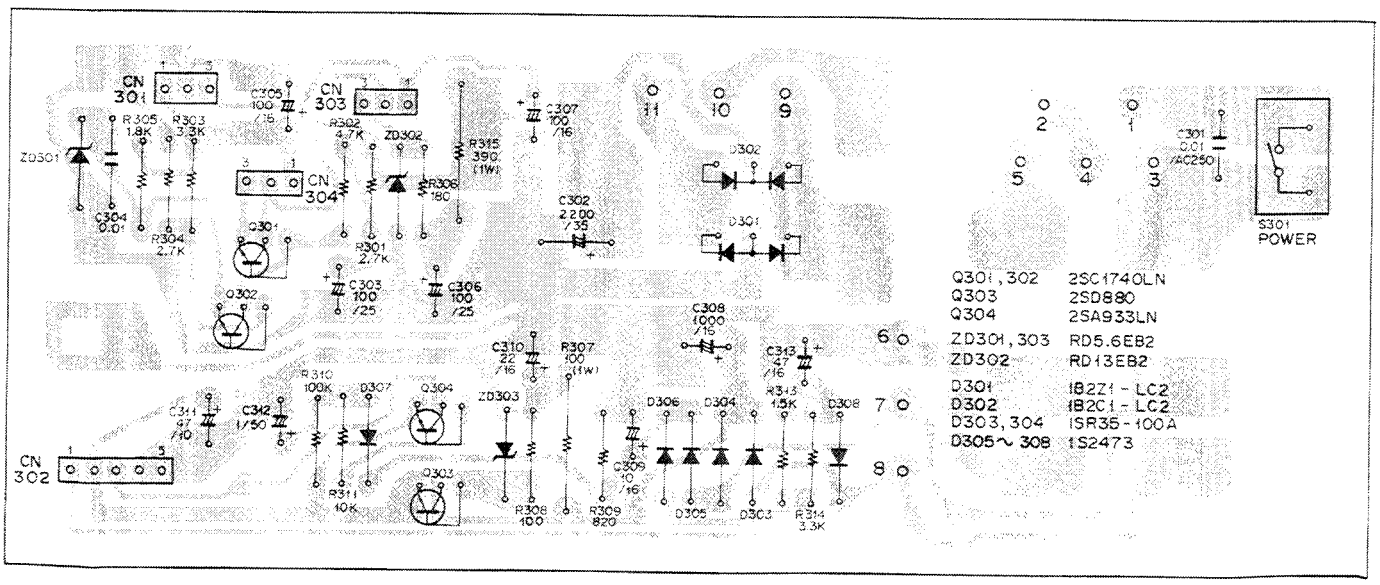
11.1 CONTRAST OF MISCELLANEOUS PARTS

CT-50R/D and D/G types are the same as the CT-50R/KU type with the exception of following sections.

Mark	Symbol & Description	Part No.			Remarks
		KU type	D type	D/G type	
	Power supply assembly	Non supply	Non supply	Non supply	
⚠ ★	Power transformer (120V)	RTT-339	.....	.....	
⚠ ★	Power transformer (120V, 220V, 240V)	.....	RTT-342	RTT-342	
⚠	AC power cord	RDG-048	RDG-050	RDG-050	
⚠★★	Fuse (1.6A)	REK-074	.....	.....	
⚠★★	Line voltage selector	.....	RSX-056	RSX-056	
	Packing case	RHG-603	RHG-607	RHG-645	
	Operating instructions (Spanish)	.....	RRD-064	.....	
	Vinyl pouch	.....	.....	RHL-018	(For operating instructions)

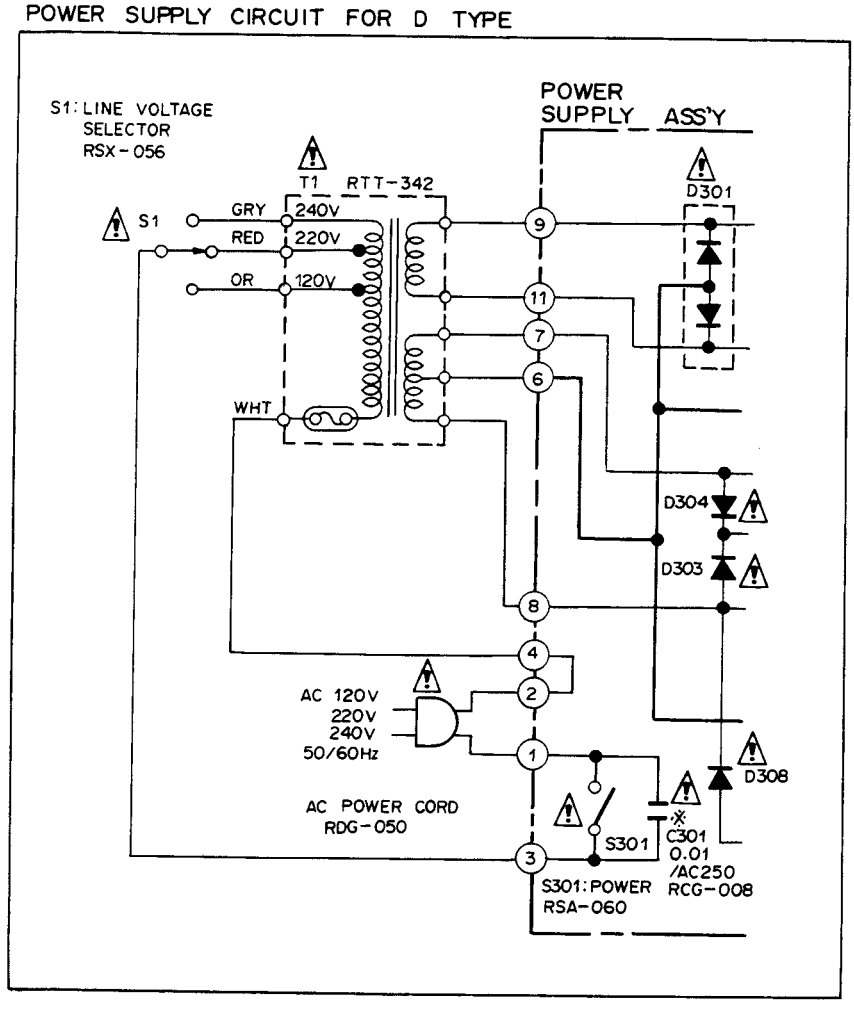
- The power supply assembly (for D, D/G types) is the same as the power supply assembly (for KU type) with the exception of the fuse holder.

11.2 POWER SUPPLY ASSEMBLY FOR D AND D/G TYPES



11.3 SCHEMATIC DIAGRAM

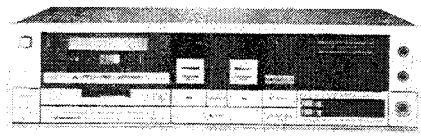
POWER SUPPLY CIRCUIT FOR D TYPE



PIONEER

Service Manual

CIRCUIT & MECHANISM DESCRIPTIONS



ORDER NO.
ARP-439-0

STEREO CASSETTE TAPE DECK

CT-50R

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS [USA] INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

YH © AUG. 1983 Printed in Japan

1. MECHANICAL OPERATION

The CT-50R mechanical section includes two motors (for capstan and reel drive) and three solenoids (one for "assist trigger", one for direction switching, and one for MS operations which also serves in brake release) in addition to other structural parts. Rotational torque of the flywheels is used as the drive source for head rotation and head shifting. The same recording/playback and erase heads being used during forward (FWD) and reverse (REV) mode by rotating the head by 180°.

Stop Mode

Fig. 1-1 shows major component parts located at the rear of the chassis as seen from the panel.

Capstan motor rotation is transferred to flywheels L and R by capstan belt, flywheel L being rotated clockwise and flywheel R counter-clockwise. The cam gear located in the center consists of cam A for head shift formed on the front, and cam B for head rotation formed on the rear. Rotating torque is supplied by trigger spring, the cam gear being rotated clockwise.

In stop mode, the hook of the trigger lever is engaged by the cam gear stopper, the cam gear being held stationary in the position shown in Fig. 1-1.

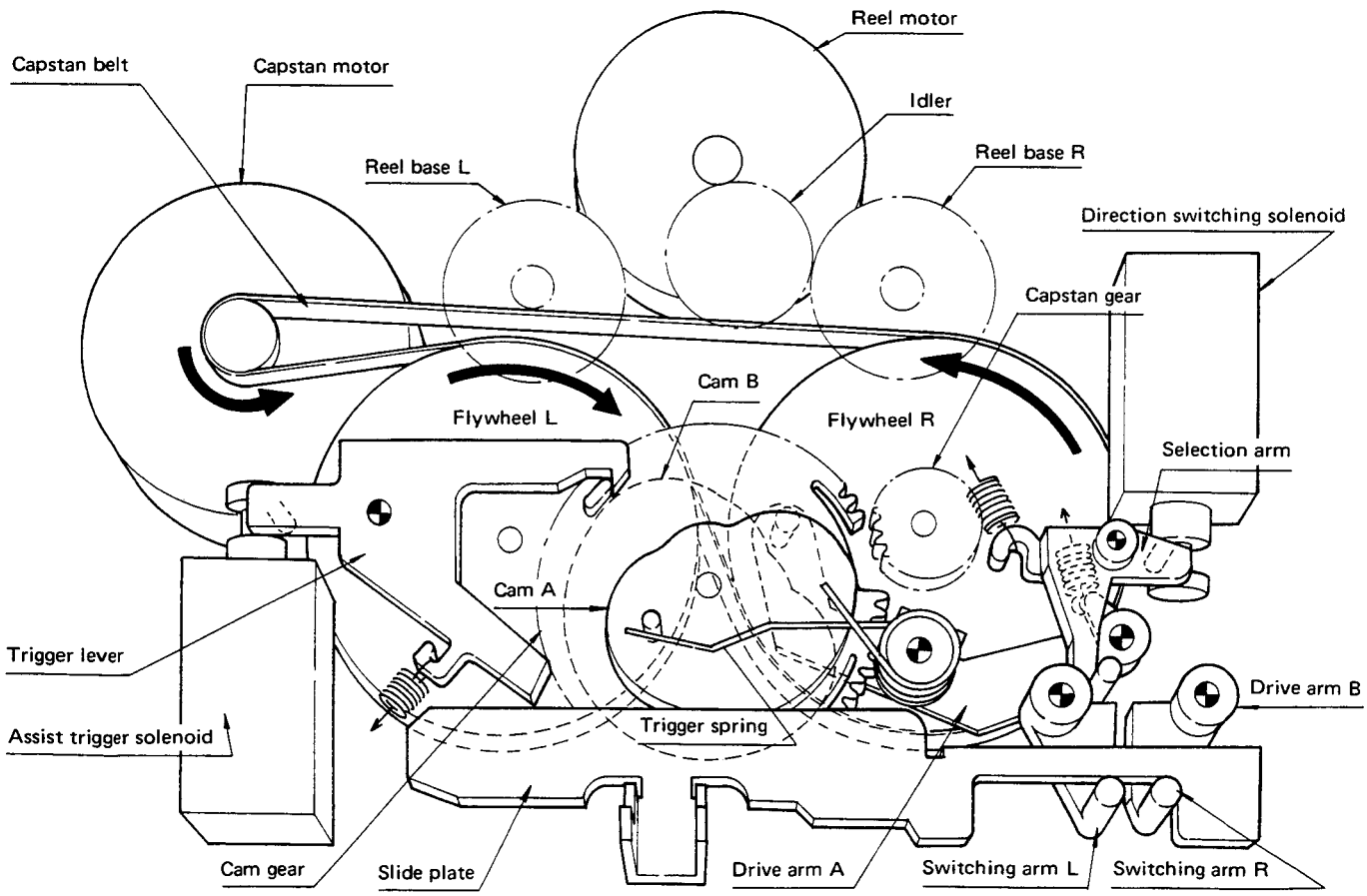


Fig. 1-1 Arrangement of main mechanism (in STOP mode)

Play Mode

Play mode may or may not be accompanied by head rotation. The mechanism incorporated in this deck is designed to lift the head into PLAY position after the head has been rotated if the head direction during stop mode is not the same as that required for the next play mode operation.

1) From REVERSE STOP to FORWARD PLAY mode

When the FORWARD PLAY button is pressed, the direction switching solenoid is activated, and the selection arm is rotated counter-clockwise. Drive arm B attached to drive arm A is pushed by the selection arm, resulting in drive arm B being rotated counter-clockwise around to the right (see Fig. 1-2).

About 100ms after the direction switching solenoid is activated, the assist trigger solenoid is activated, resulting in the trigger lever being turned counter-clockwise. The trigger lever hook is consequently disengaged from the cam gear stopper, resulting in the cam gear being turned clockwise by the trigger spring to engage the capstan gear fixed to flywheel R. Due to the flywheel R rotation, the cam gear continues to turn, resulting in cam B formed on the rear of the cam gear rotating drive arm A clockwise.

Drive arm B attached to drive arm A consequently forces switching arm R to turn counter-clockwise. The pin at the tip of switching arm R pushes against the side of the slide plate which is consequently pushed across to the right hand side (see Fig. 1-3).

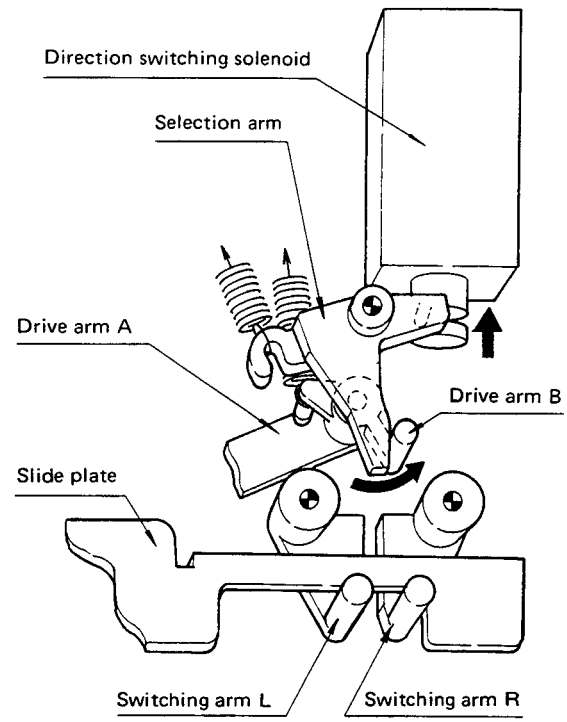


Fig. 1-2 Forward play operation (1)

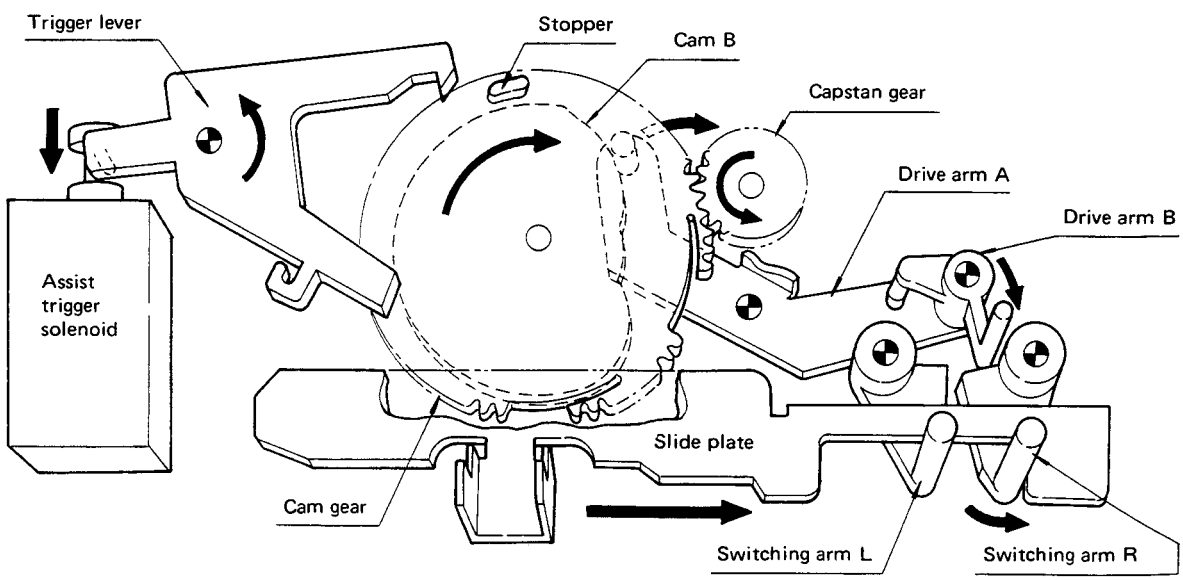


Fig. 1-3 Forward play operation (2)

The bent section in the center of the slide plate engages the head rotation drive sector gear, thereby rotating the head through 180° from REVERSE status to FORWARD status (see Fig. 1-4). At the same time, the switching plate in the front of the chassis is pushed by the bent section of the slide plate across to the right hand of the diagram. This completes the head inversion operation.

The direction switching solenoid is released about 200ms after the assist trigger solenoid is activated.

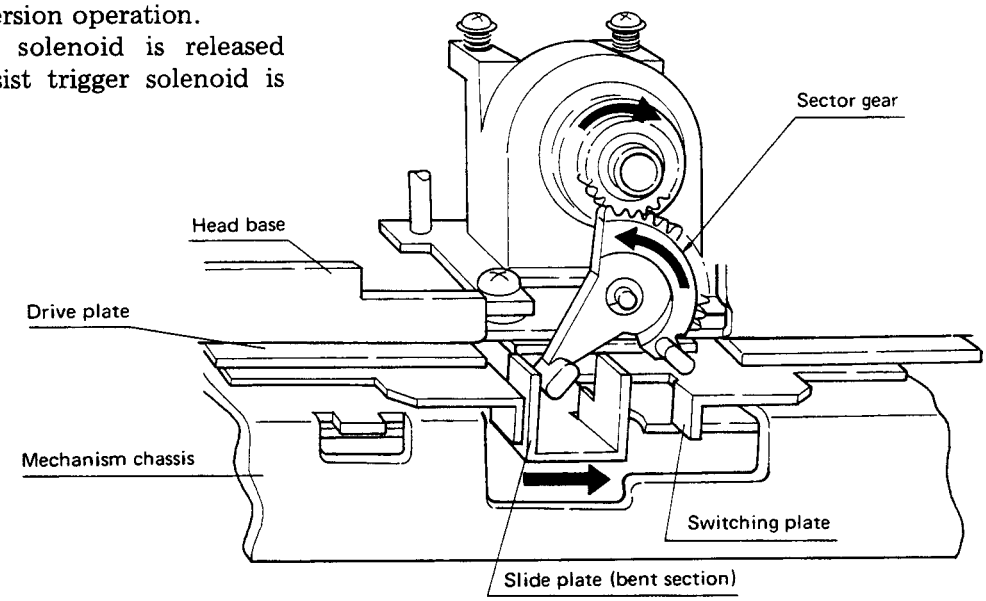


Fig. 1-4 Tape head rotation operation

After completion of the head inversion operation, the cam gear continues to turn, cam A lifting shaft (C) fitted into the drive plate. The drive plate has elongated holes on both the left and right hand sides, and by engaging shafts (D) and (E) fitted to the left and right hand sides of the switching plate to join the two plates together, the plates are lifted as a single unit (see Fig. 1-5).

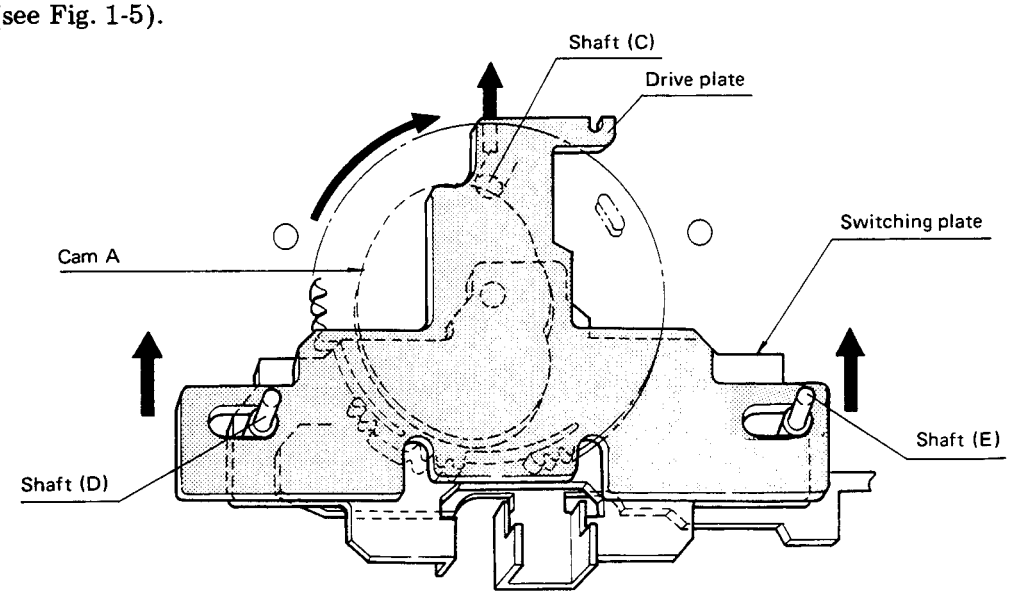


Fig. 1-5 Tape head lifting operation

Furthermore, since the drive plate and head base are coupled together by head base spring, the head base is also lifted at the same time. However, the head base is stopped when it meets the chassis stopper to maintain the PLAY position. The switching plate and drive plate continue to move upward with extra extension of the head base spring.

Shaft (E) in the right hand side of the switching plate pushes the bent portion of guide arm R upwards at this time, thereby turning guide arm R and lowering the tape guide on the REVERSE side to a position where it does not make contact with the tape (see Fig. 1-6). At the same time, the front edge of the switching plate pushes shaft (G) on pinch drive plate R upwards, thereby pressing the FORWARD side pinch roller against the capstan (see Fig. 1-7).

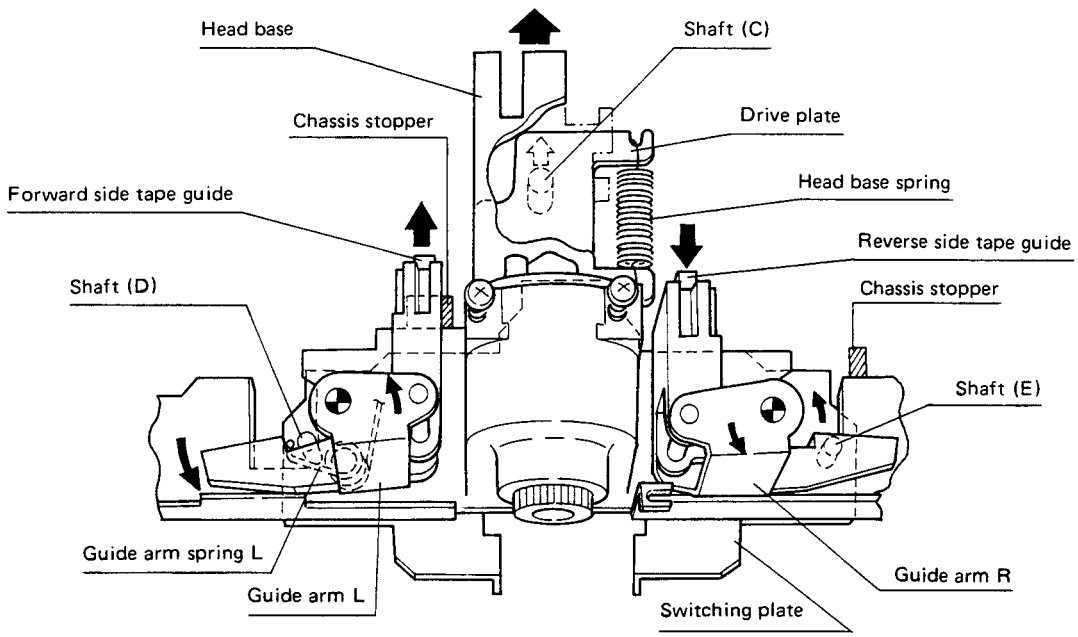


Fig. 1-6 Tape guide selection operation (forward)

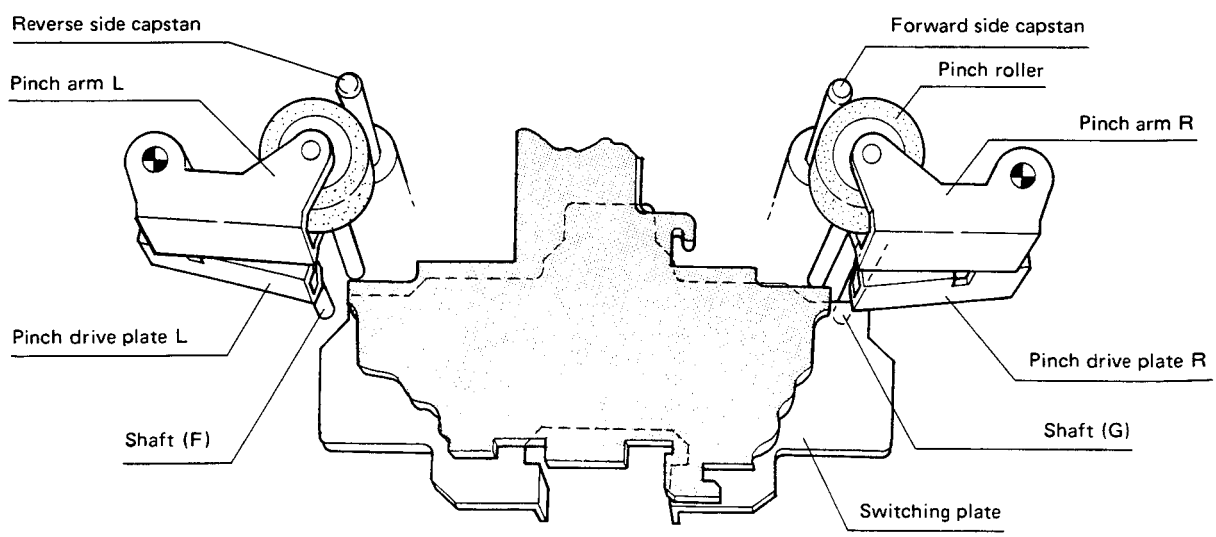


Fig. 1-7 Pinch roller pressure contact operation

Since shaft (D) on the switching plate, on the other hand, moves upwards bypassing the bent portion of guide arm L on the FORWARD side, the FORWARD side guide puts additional pressure in the upward direction through guide arm spring L, thereby maintaining the PLAY position (see Fig. 1-6).

And since shaft (F) on pinch drive plate L does not make contact with the front edge of the switching plate in the FORWARD status, the REVERSE side pinch roller is kept away from the capstan (see Fig. 1-7).

When the upward thrust from cam A reaches a maximum, the cam gear is disengaged from the capstan gear, the cam gear stopper is met by the end of the trigger lever, and the PLAY operation is completed.

The brake plate, too, is pushed up at this time by shaft (C) on the drive plate, thereby separating the brake shoe from the reel base to release the brake (see Fig. 1-8).

The reel motor commences turning, resulting in the idler being forced against the take-up (right hand side) reel to take up tape from the capstan.

2) From FORWARD STOP to FORWARD PLAY mode

This switching operation is basically the same as the operation described above. But since the slide plate is on the right hand side of the diagram (FORWARD status), there is no slide plate movement when switching arm R is rotated. That is, this operation only involves the lifting into the PLAY position without any head rotation.

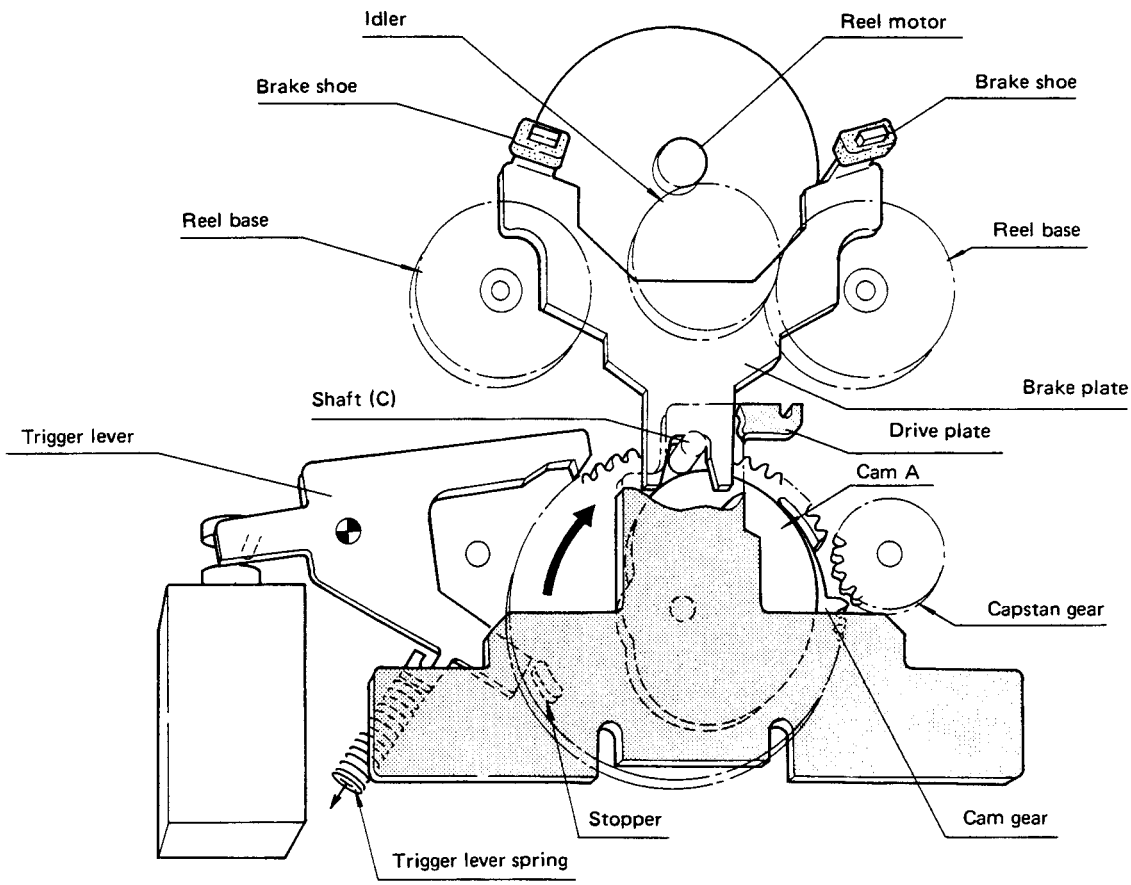


Fig. 1-8 Reel brake release and reel take-up torque generation

3) From FORWARD STOP to REVERSE PLAY mode

Unlike FORWARD PLAY mode, the direction switching solenoid is not activated during REVERSE PLAY mode. Consequently, drive arm B attached to the drive arm A is kept on the switching arm L side constanly by the drive arm spring (see Fig. 1-9).

When the REVERSE PLAY button is pressed, the assist trigger solenoid is activated, cam B drives drive arm A, and drive arm B forces switching arm L around clockwise. Since the slide plate is over on the right hand side (FORWARD mode) at this time, the pin in the end of switching arm L pushes against the inside edge of the slide plate which is subsequently forced across to the left hand side (see. Fig. 1-9).

During this operation, the head is inverted by 180° from FORWARD mode to REVERSE mode. The switching plate at the front of the chassis is shifted to the left hand side at the same time. Following the head inversion operation, the drive plate, switching plate, and head base are lifted up by action of cam A.

After the head base is lifted to the PLAY position, shaft (D) on the left hand of the switching plate presses up against the bent portion of guide arm L, resulting in guide arm L being rotated,

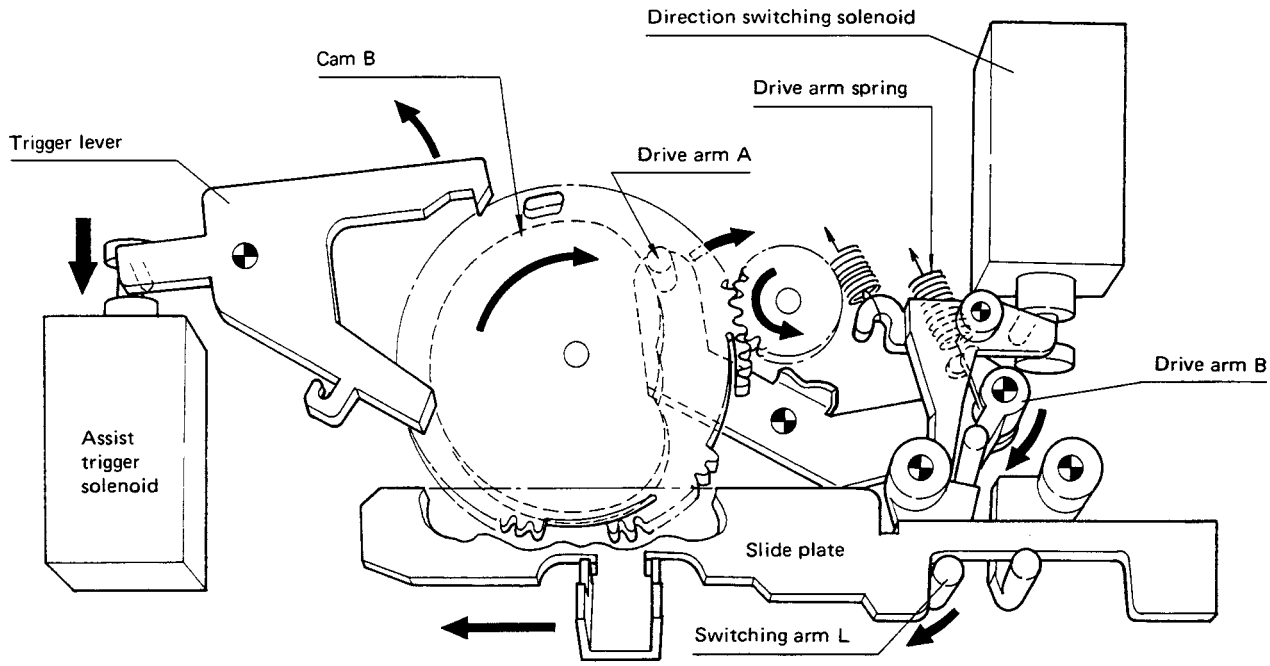


Fig. 1-9 Reverse play operation (1)

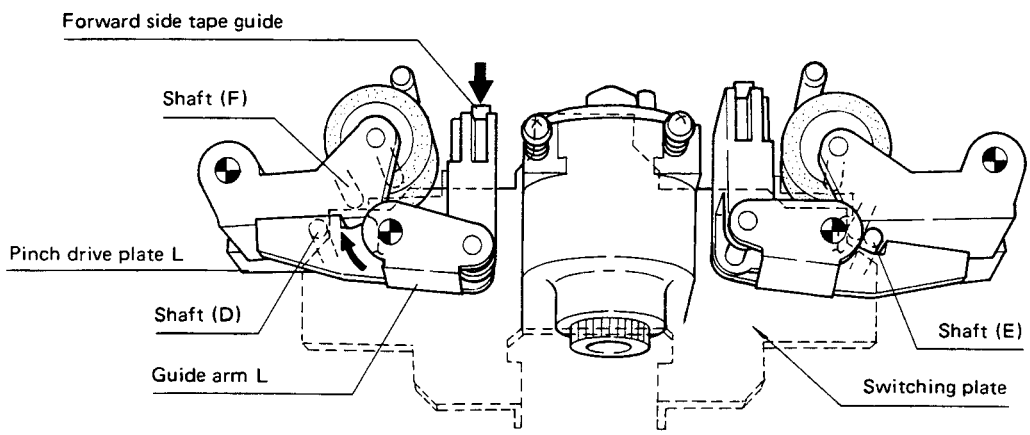


Fig. 1-10 Reverse play operation (2)

and the FORWARD side guide being lowered to a position where it does not make contact with the tape. At the same time, the front edge of the switching plate forces shaft (F) on pinch drive plate L upwards to press the REVERSE side pinch roller against the capstan (see Fig. 1-10).

4) From REVERSE STOP to REVERSE PLAY mode

Since the slide plate is already positioned on the left hand side (REVERSE mode) in this case, there is no slide plate movement when switching arm L rotates (see Fig. 1-9). Hence, this operation consists only of lifting into the PLAY position without any head inversion.

5) From PLAY to STOP mode

When current to the assist trigger solenoid is switched off, the trigger lever spring dislodges the end of the trigger lever from the cam gear stopper. Since shaft (C) of the drive plate is pressing against the cam surface at this time, the cam gear is rotated and engaged with the capstan gear (see Fig. 1-8).

As a result of the cam gear rotation, the drive plate, switching plate, and head base are lowered, and the cam gear is disengaged from the capstan gear just prior to reaching the STOP position.

The trigger spring keeps the cam gear rotating until the cam gear stopper is caught by the trigger lever hook (see Fig. 1-1).

FF and REW modes (Fig. 1-11).

When the MS solenoid is activated, both the solenoid lever and the brake lever are rotated clockwise. The pin at the end of the brake lever forces the brake plate upwards, thereby releasing the brake by separating the brake shoe from the reel base.

Furthermore, the reel motor commences to rotate when the solenoid is activated, resulting in the idler being pressed against the take-up reel to take up tape.

MS Operation (Fig. 1-12).

Operation during MS mode is a combination of PLAY and FF (or REW) mode operations. When the FF or REW button is pressed after the MS button has been pressed, the MS solenoid is activated, resulting in the solenoid lever and brake lever being rotated clockwise and the brake being released (see Fig. 1-11).

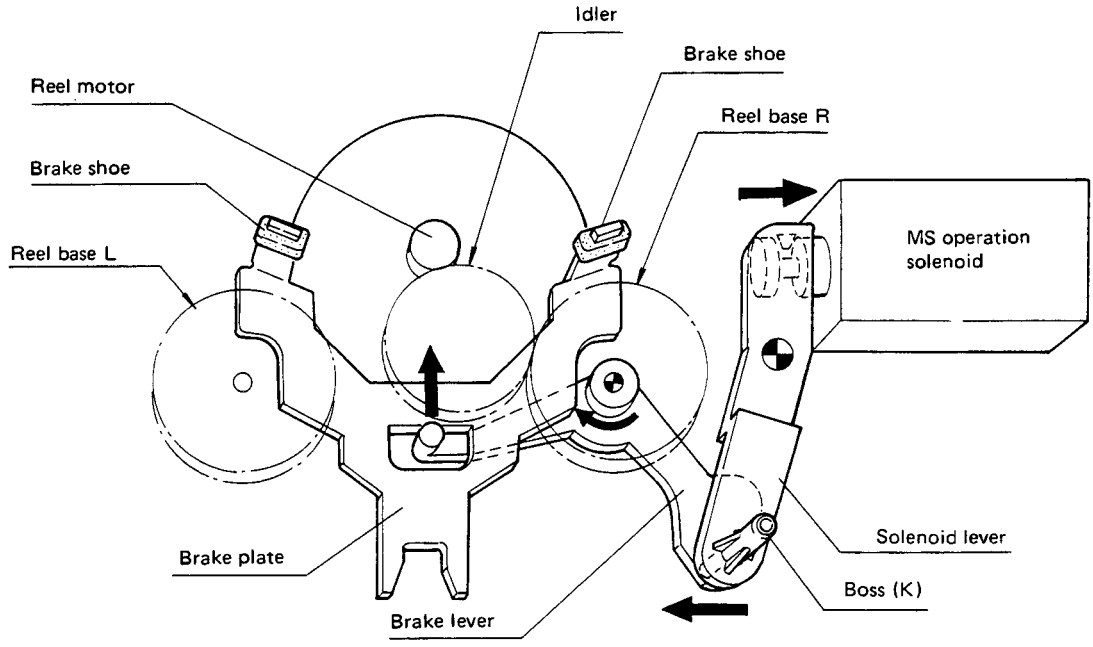


Fig. 1-11 FF/REW operation

Boss (K) at the end of the solenoid lever is engaged with the MS plate at the front of the chassis at this time, resulting in the MS plate also being shifted to the left. Pinch levers L and R are interlinked with the MS plate by respective bosses (H) and (I) positioned in the slits at both ends of the MS plate. Therefore, the ends of pinch levers L and R turn towards the center of the chassis. The assist trigger solenoid is activated about 100ms after the MS solenoid has been activated. The head base is therefore lifted by the cam gear in the same way as during PLAY mode operation. Before reaching the PLAY position, the bent portion (J) of the head base meets the MS plate and consequently keeps the head base in the MS position.

The drive plate and switching plate continue to be pushed upwards, thereby pushing the pinch drive plate up to a position where the pinch roller is about to be pressed against the capstan. But since the pinch roller shaft meets the end of the pinch lever, the roller is not actually pressed against the capstan.

When the cam passes the maximum point, the cam gear stopper meets the end of the trigger lever to result in completion of the operation. The reel motor is also rotated at the same time, resulting in take up of the tape. Note that the MS solenoid is activated for a period of about 500ms.

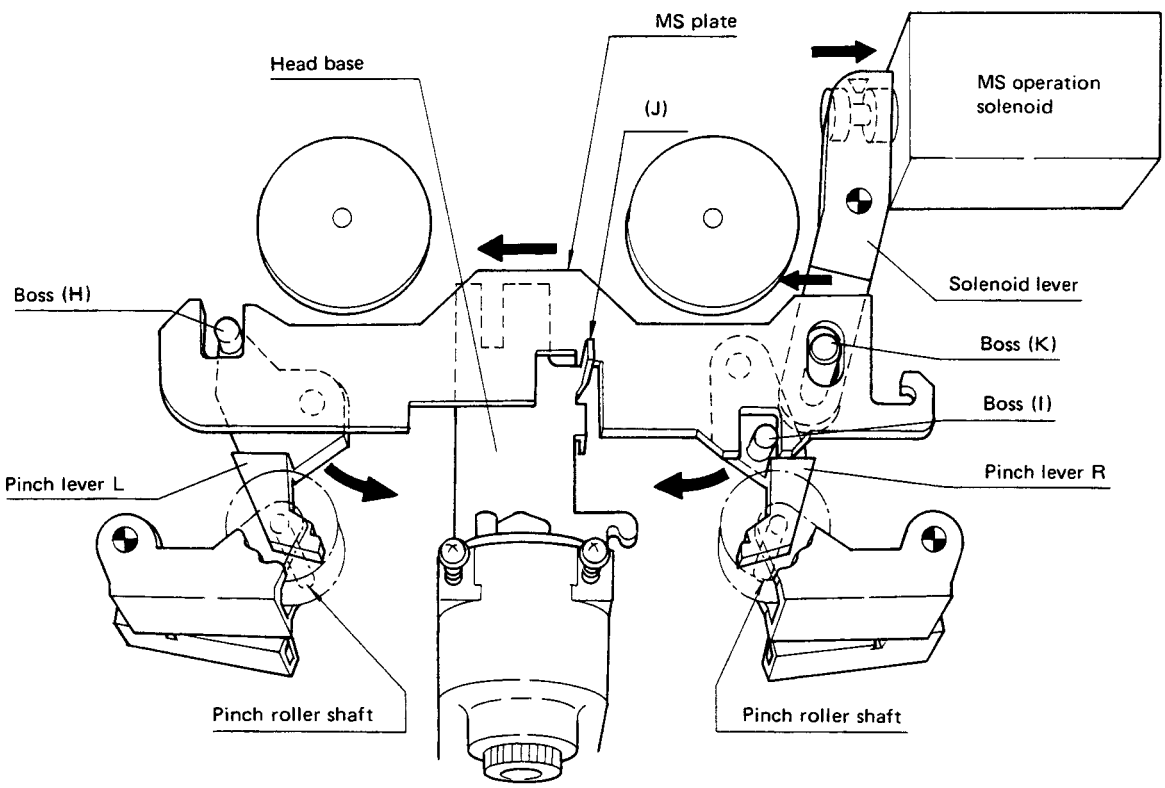
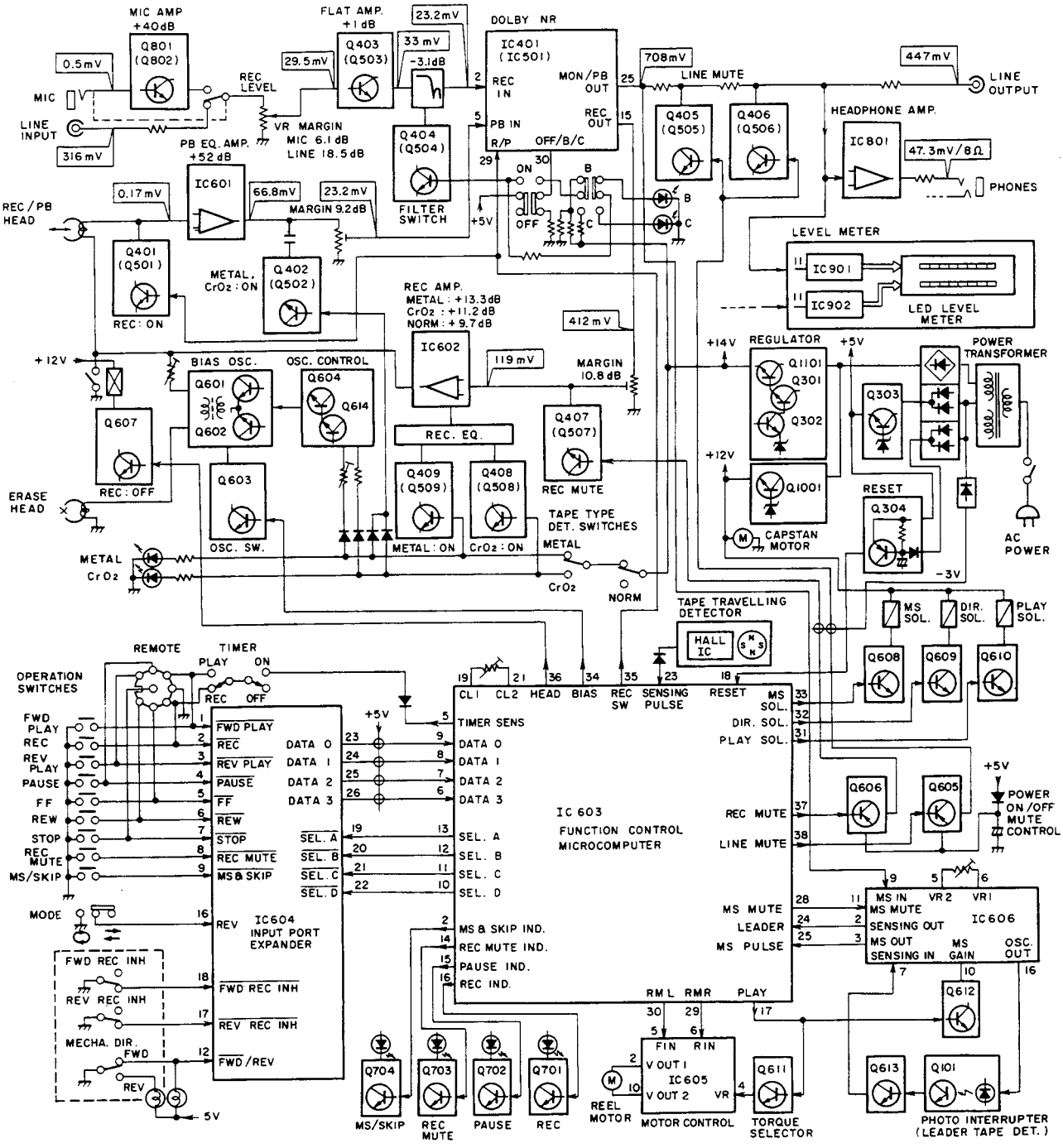


Fig. 1-12 Music search operation

2. BLOCK DIAGRAM



3. IC TECHNICAL DATA

PD4035

Pin No.	Symbol	I/O Status	Description
1	X2		Non use
2	MS & SKIP IND	Output	MS/SKIP indicator output. H level during MS/SKIP mode.
3			Non use (normally low output).
4	B/S IND	Output	BLANK SEARCH indicator output. H level during BLANK SEARCH mode. (Non use)
5	TIMER SENS.	Output	TIMER REC/PLAY start trigger output. 4 sec FOLLOWING POWER ON — 1 ms
6	DATA 3	Input	Data input from LC7800
7	DATA 2	Input	
8	DATA 1	Input	
9	DATA 0	Input	
10	SEL. D	Output	Transfer data selection clock output to LC7800
11	SEL. C	Output	
12	SEL. B	Output	
13	SEL. A	Output	
14	0 REC MUTE	Output	REC MUTE indicator output. H level during REC MUTE mode.
15	0 PAUSE	Output	PAUSE indicator output. H level during PAUSE mode.
16	0 REC	Output	REC indicator output. H level during REC mode.
17	0 PLAY	Output	PLAY indicator output. H level during PLAY mode.
18	RESET	Input	CPU reset input – reset by H level. Normally at L level.
19	CL1		Pin for connecting external circuit for built-in clock generator. f=200kHz
20	VDD		+5V power supply.
21	CL2		Pin for connecting external circuit for built-in clock generator. f=200kHz
22	φPULSE	Input	MEMORY stop input. Input by rise edge of a pulse. (Non use)
23	SENSING	Input	Sensing pulse input. REEL TURNING
24	LEADER PULSE	Input	Leader tape detection pulse input (from pin 13 of PA3010) ← TAPE LEADER DETECTED
25	MS PULSE	Input	Blank detection pulse input (from pin 2 of PA3010)
26	JMS END	Input	Music skip search end input. Input by fall edge of a pulse. END → (Non use)
27	JMS ENABLE	Output	Music skip search enabling output. H level during Music skip search mode. (Non use)
28	MS MUTE	Output	MS inhibit output.
29	RM. R	Output	Reel motor R control output. H level during FF, PLAY, REC and CUE modes.
30	RM. L	Output	Reel motor L control output. H level during REW and REVIEW modes.
31	PLAY SOL.	Output	Solenoid (PLAY) control (H level when solenoid activated)
32	DIR SOL.	Output	Solenoid (DIR) control (H level when solenoid activated)
33	MS SOL.	Output	Solenoid (MS) control (H level when solenoid activated)
34	BIAS	Output	Bias oscillator control output. H level during REC-PLAY and REC-PAUSE modes.
35	REC SW	Output	Signal path switching control (REC/PB). H level during REC-PLAY and REC-PAUSE modes.
36	HEAD SW	Output	For REC/PB switching (H level when PLAY, STOP, FF, REW and PAUSE modes).
37	REC MUTE	Output	Recording signal muting control. L level during when not in REC-PLAY mode.
38	LINE MUTE	Output	Line output muting control. L level during STOP, FF, REW, STOP-PAUSE and PLAY-PAUSE modes.
39	GND		Ground.
40	X1		Non use.

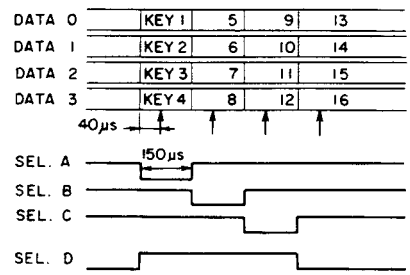


Fig. 3-1 PD4035 pin description

Pin No	SYMBOL \ MODE	STOP		FF		REW		CUE		REVIEW		PLAYBACK		RECORDING		STOP-PAUSE		PLAY-PAUSE		REC-PAUSE		REC MUTE	
		FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV	FWD	REV
31	PLAY SOL	L (OFF)		L		L		H		H		H		H		L		L		L		H	
32	DIR SOL	L (OFF)		L		L		L		L		L		L		L		L		L		L	
32	MS SOL	L (OFF)		H		H		L		L		L		L		L		L		L		L	
29	RM R	L (OFF)		H		L		H		L		H	L	H	L	L		L		L		H	L
30	RM L	L (OFF)		L		H		L		H		L	H	L	H	L		L		L		L	H
38	LINE MUTE	L (ON)		L		L		L		L		H		H		L		L		H		H	
37	REC MUTE	L (ON)		L		L		L		L		L		H		L		L		L		L	
34	BIAS	L (OFF)		L		L		L		L		L		H		L		L		H		H	
36	HEAD SW	H (ON)		H		H		H		H		H		L		H		H		L		L	
35	REC SW	L (OFF)		L		L		L		L		L		H		L		L		H		H	
17	PLAY IND	L (OFF)		L		L		L		L		H		H		L		H		H		H	
16	REC IND	L (OFF)		L		L		L		L		L		H		L		L		H		H	
15	PAUSE IND	L (OFF)		L		L		L		L		L		L		H		H		H		L	
14	REC MUTE IND	L (OFF)		L		L		L		L		L		L		L		L		L		H	

Fig. 3-2 PD4035 output state by mode

LC7800

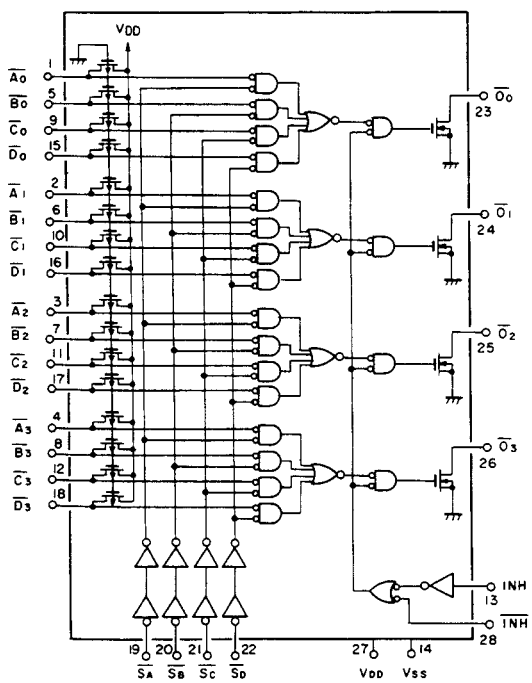


Fig. 3-3 Equivalent circuit of LC7800

INPUT																		OUTPUT			
DATA INPUT														SELECT INPUT				INHIBIT INPUT			
A				B				C				D									
AO	A1	A2	A3	BO	B1	B2	B3	CO	C1	C2	C3	DO	D1	D2	D3	SA	SB	SC	SD	INH	INH	OO	O1	O2	O3
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1	1
1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	1
1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	1
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1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1
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1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1	1	1	0
1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	1	1	1	1
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	0	1	1	1	1
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	*	1	1	1	1
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0	1	1	1	1

NOTE : 1 : [H] LEVEL / 0 : [L] LEVEL / * : DON'T CARE

Fig. 3-4 Truth table of LC7800

BA6109

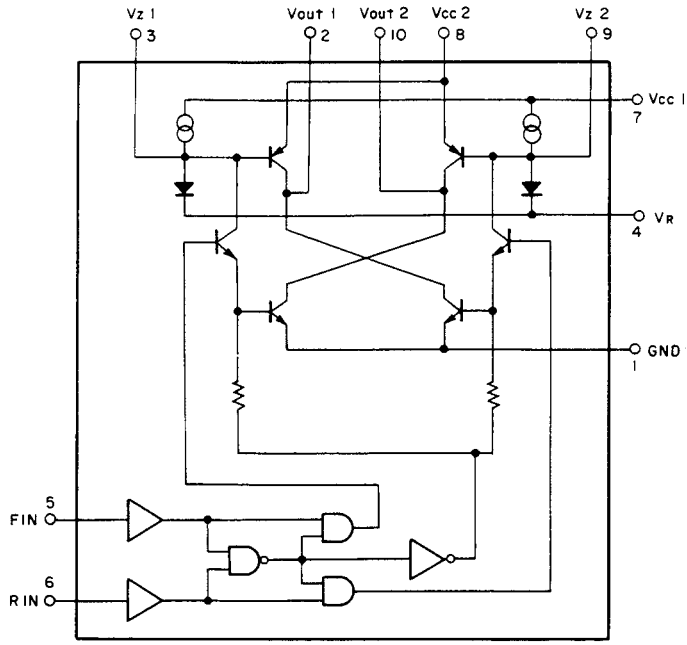


Fig. 3-5 Equivalent circuit of BA6109

Pin No.	Symbol	I/O	Description	
1	GND		GND	
2	VOUT1	OUT	Motor output (1)	
3	Vz1		Output drive (1)	
4	VR		Output voltage setting	
5	F IN	IN	Input which sets V OUT 1 to "H"	"L" → 0.7V or less
6	R IN	IN	Input which sets V OUT 2 to "H"	"H" → 2V or greater
7	VCC1		+B	
8	VCC2		Power supply	
9	Vz2		Output drive (2)	
10	VOUT2	OUT	Motor output (2)	

Fig. 3-6 BA6109 pin description

Motor Current Direction	INPUT		OUTPUT			
	FIN	RIN	Vz1	V OUT2	Vz2	V OUT2
No current flow	H	H	H	L	H	L
⑩ → ②	L	H	H	L	L	H
② → ⑩	H	L	L	H	H	L
No current flow	L	L	H	L	H	L

Fig. 3-7 Truth table of BA6109

PA3010

Pin No.	Symbol	I/O Status	Description
1	GND	–	
2	SENSING OUT	OUT	L level (0.5V max.) at magnetic coat portion of tape, and output of 100msec (min.) 4.9V (min.) pulse when leader portion of tape is reached.
3	SENSING T2	–	When the quantity of light received by the photo-senstive transistor increases sharply, a comparator located in a later stage is activated (thereby generating output pulses) due to the difference in the charging time constants of the capacitors connected to pins 3 and 4. Output pulses appear when there is a sharp increase of at least 6dB in the input voltage.
4	SENSING T1	–	
5	VR2	–	Terminals for control of the feedback current capable of a altering the gain of the compression circuit (compensation possible when there is fluctuation in the photo-sensitive transistor input).
6	VR1	–	
7	SENSING IN	IN	Photo-sensitive transistor output is applied to pin 7 after amplification (20dB).
8	Vcc1	–	20V DC
9	MS IN	IN	Tune interval detection input. A playback signal input above –73dBv denotes "tune", while an input level below that denotes a blank portion of tape between tunes. (Playback mode).
10	MS GAIN	–	Determines the gain of the tune-interval detection circuit.
11	MS MUTE	IN	Muting pin. Muting is applied if voltage greater then 1.6V is applied. Tune-interval detection circuit consequently stops operating (no tune-interval output).
12	MS T	–	Pin for determining the tune-interval detection time and the tune detection time by the capacitance of externally connected capacitors.
13	MS OUT	OUT	Tune-interval detection pin. L level (0.5V max.) for "tune" status, and H level (3.9V min.) for "tune-interval" status.
14	Vcc 2	–	5V DC
15	OSC C	–	Determination of the frequencies for activation of the infrared LED in the leader tape detector sensor utilizing externally connected capacitors.
16	OSC OUT	OUT	Infrared LED drive pin. 2kHz 40% duty pulse signal

NOTE:
The leader tape detector circuit generates pulse outputs when the leader tape is reached. Note, however, that PD4035 is not activated in the first few seconds after start of tape deck operation (playback, fast forward etc). Leader tape detection during that period, therefore, is not possible.

Fig. 3-8 PA3010 Pin description

4. CIRCUIT DESCRIPTIONS

In the CT-50R, the same recording/playback and erase heads being used during forward (FWD) and reverse (REV) modes by rotating the heads by 180°.

4.1 SYSTEM CONTROL SECTION

The system control section includes four ICs.

1. PD4035 (4-bit microcomputer)
   Control of mechanism, signal path, and operation of various functions.
2. LC7800 (input port expander of microcomputer)
   Conversion of key input to 4-bit (parallel) time-sharing code data.
3. PA3010 (detector IC)
   Detection of unrecorded portions of tape (sections between tunes in music tapes) required for the music search (MS) operation, and detection of leader tape for detecting end of tape. Operation of the relevant function is achieved by detector signals from this IC to PD4035.
4. BA6109 (motor control IC)
   Reel motor drive controller.

Initial Outputs of PD4035 (Power ON Reset)

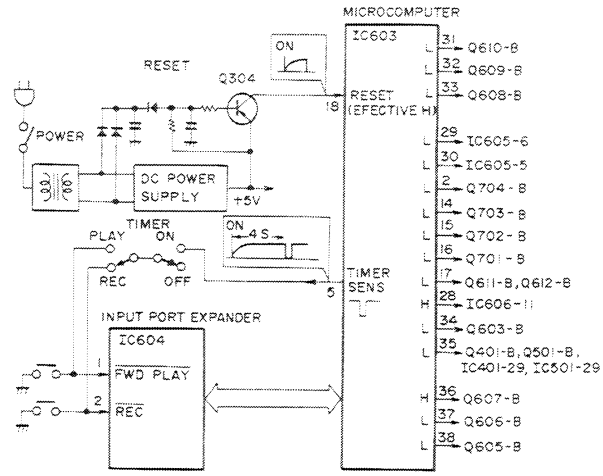


Fig. 4-1 Initial outputs of PD4035

When Switching from STOP to FWD PLAY mode

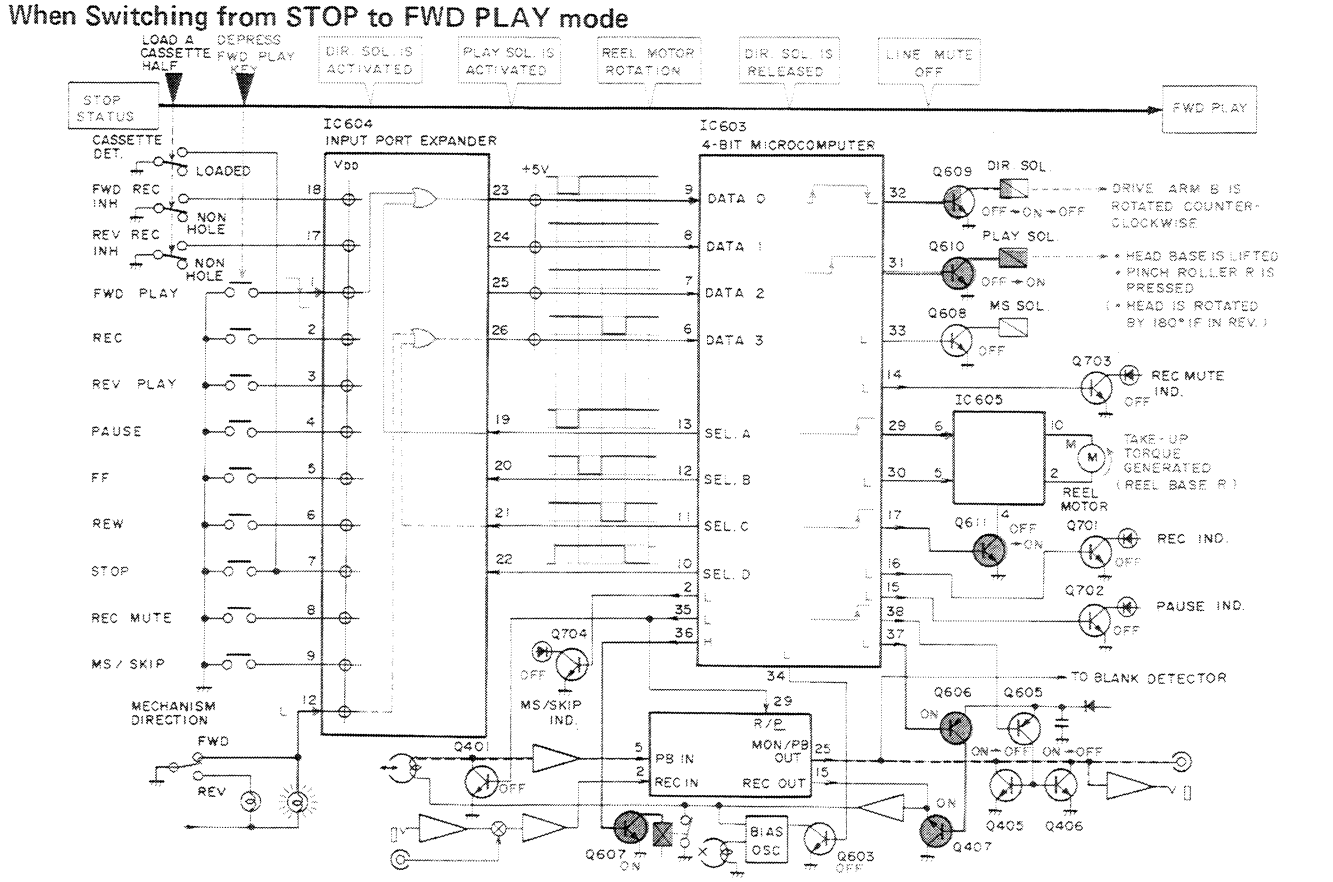


Fig. 4-2 When switching from STOP to FWD PLAY mode

When Switching from STOP to FF mode

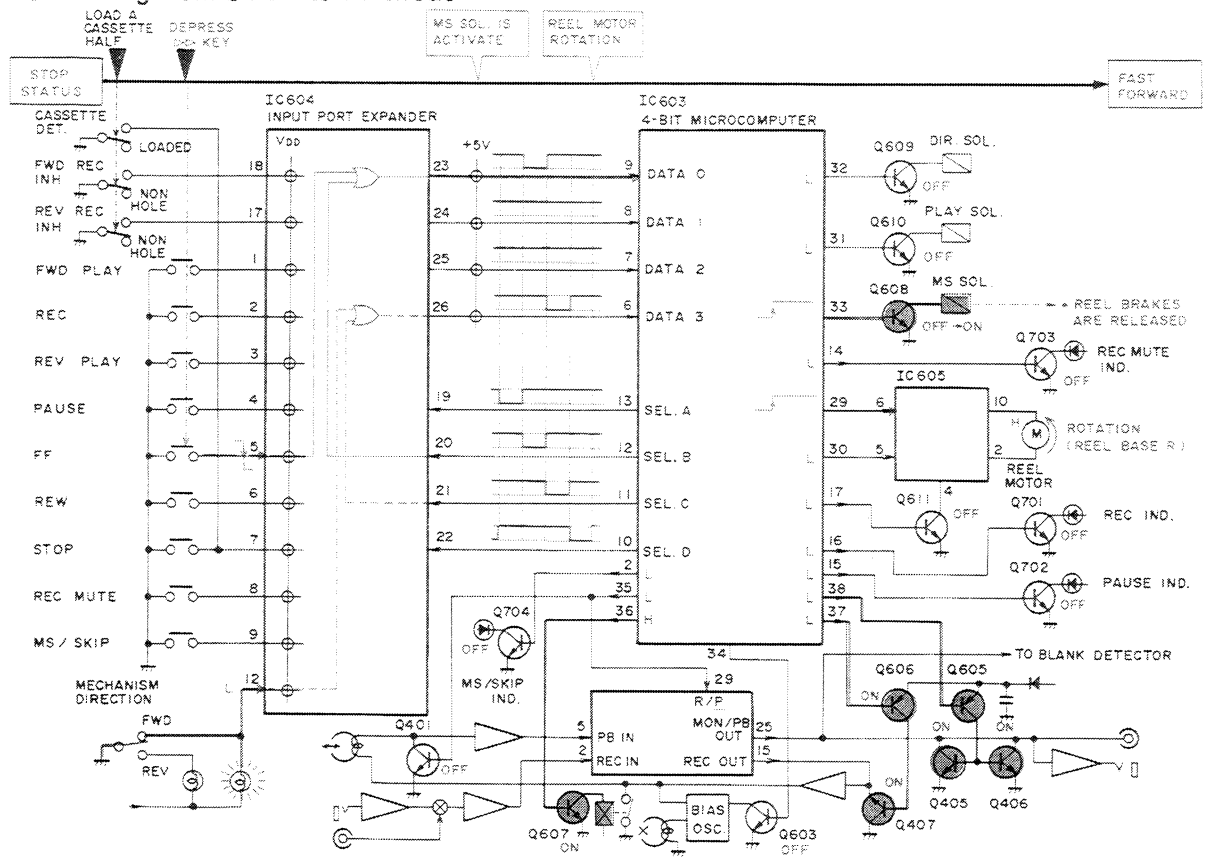


Fig. 4-3 When switching from STOP to FF mode

When Switching from STOP to REW mode

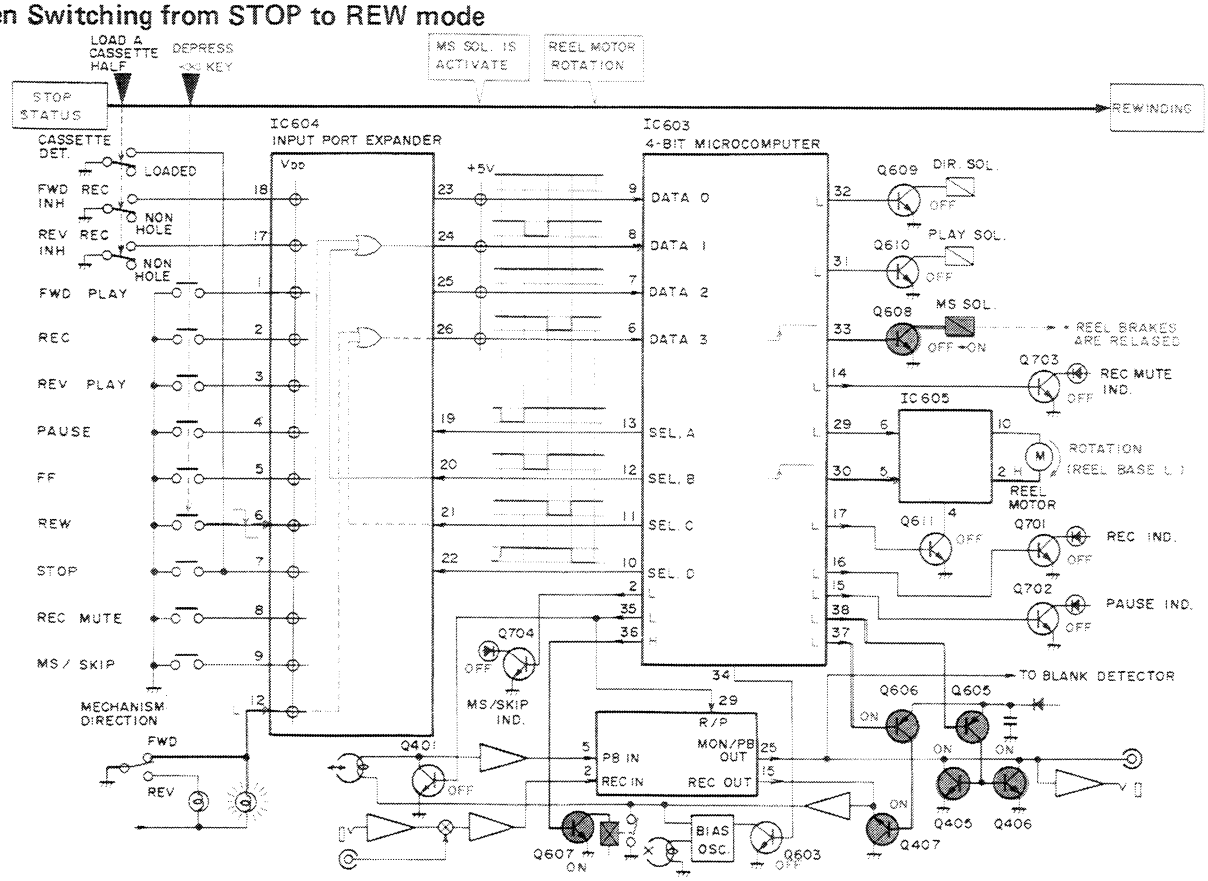


Fig. 4-4 When switching from STOP to REW mode

When Switching from STOP to REC-PAUSE mode

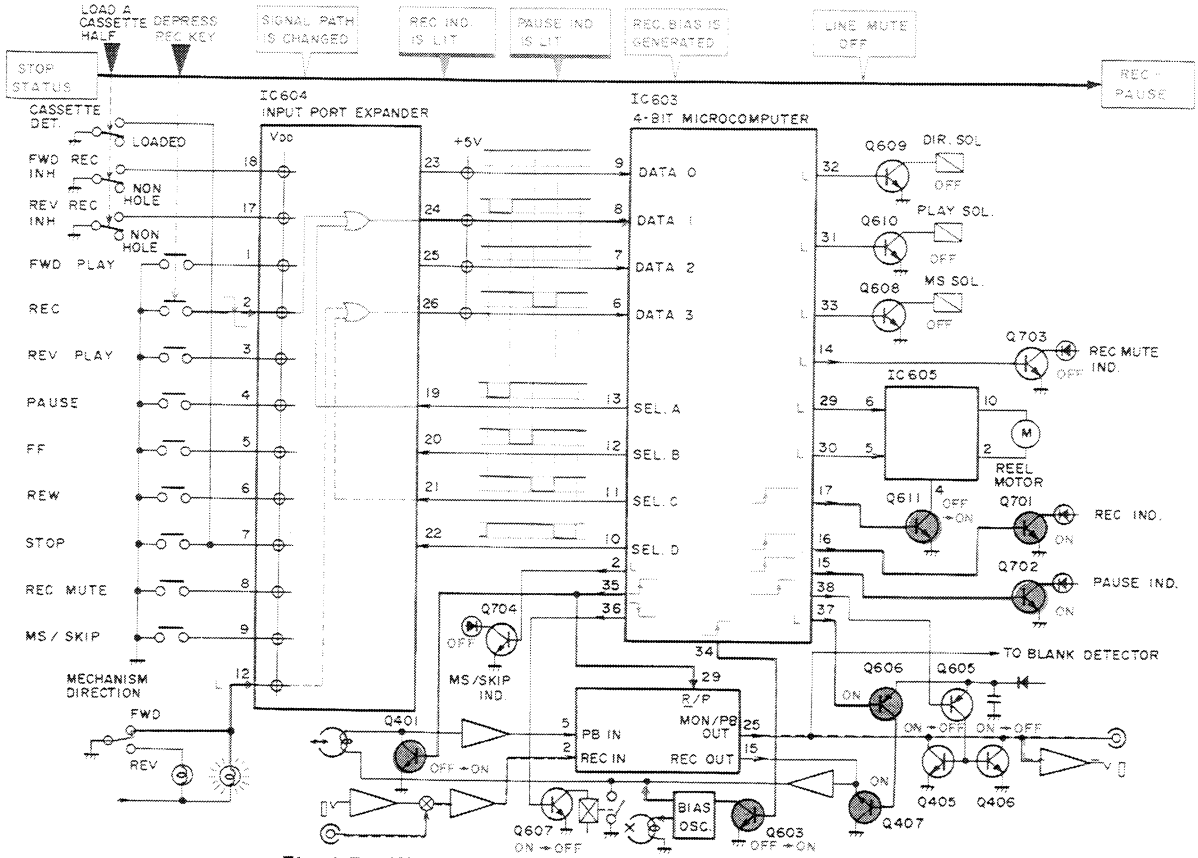


Fig. 4-5 When switching from STOP to REC-PAUSE mode

When Switching from REC-PAUSE to RECORDING mode

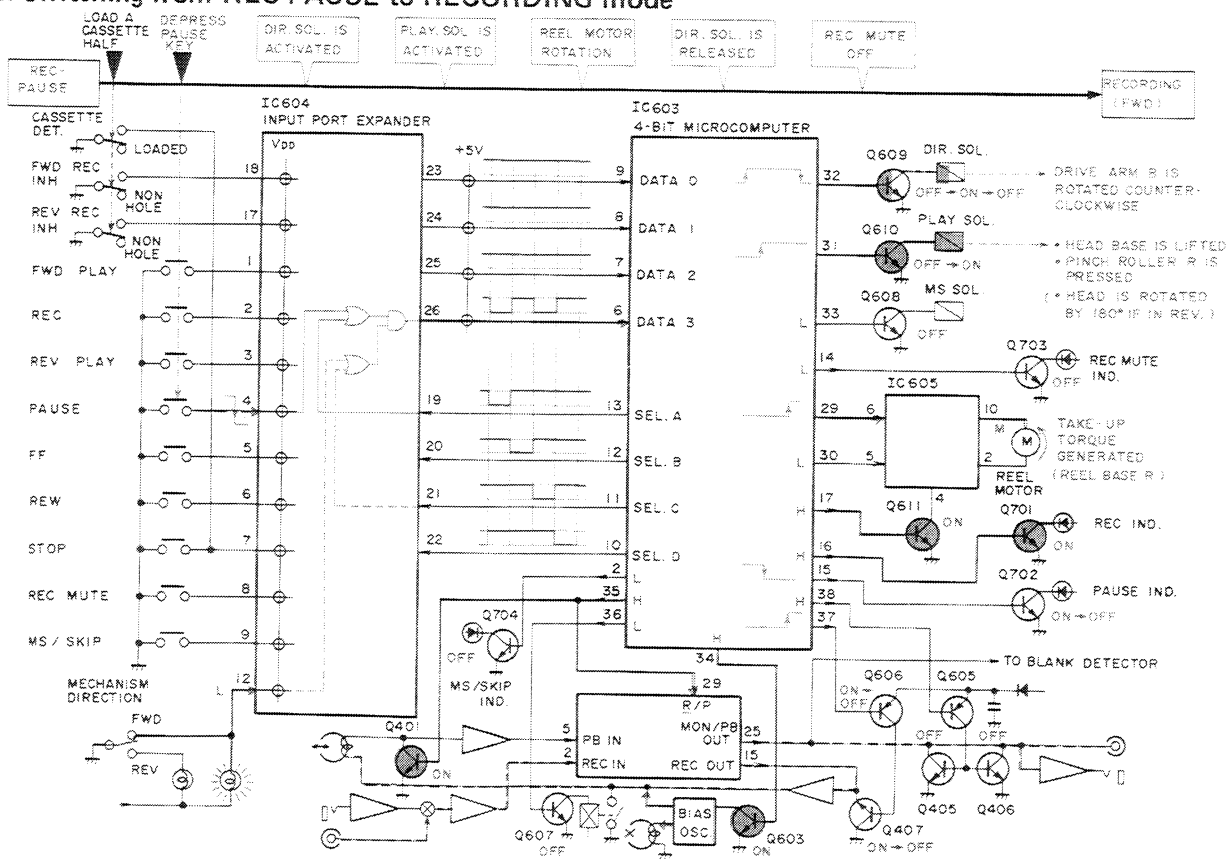


Fig. 4-6 When switching from REC-PAUSE to RECORDING mode

REC MUTE Function

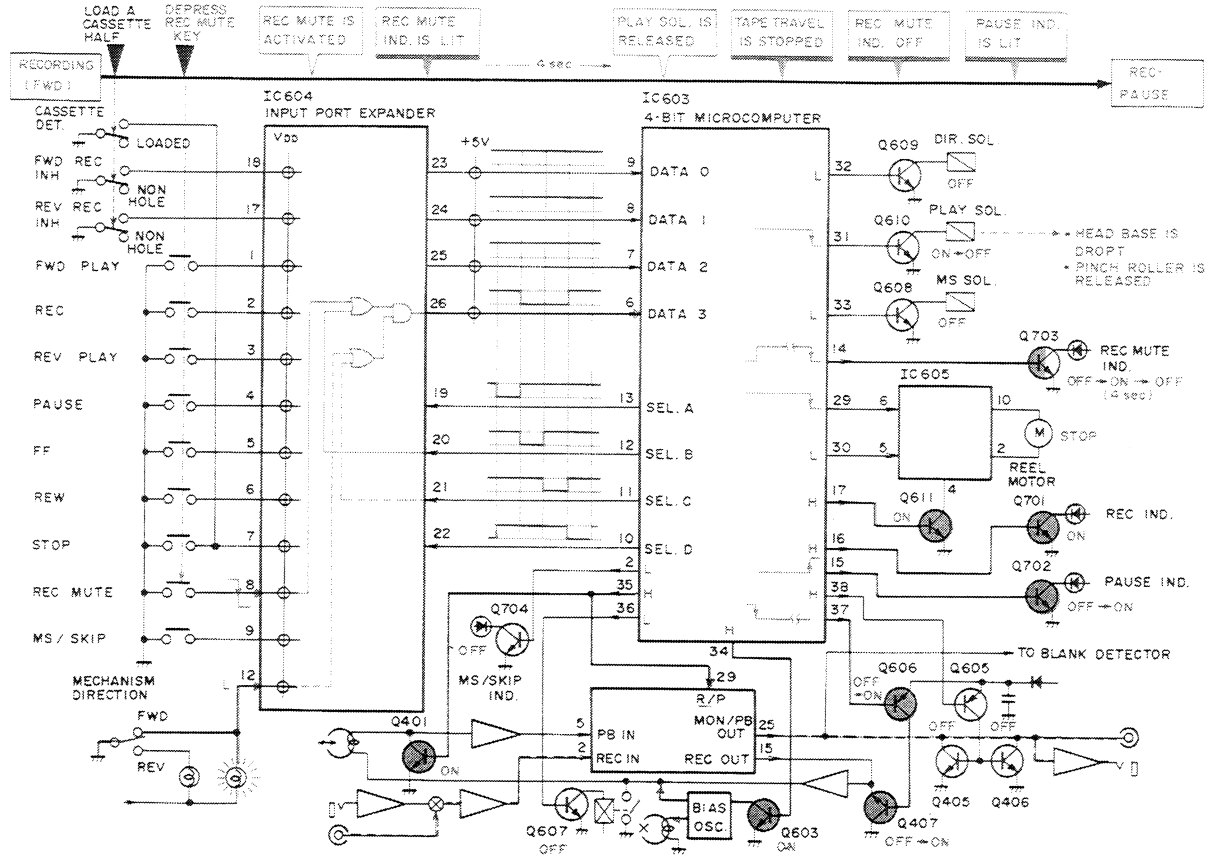


Fig. 4-7 REC MUTE Function

When Switching from STOP to REV PLAY mode

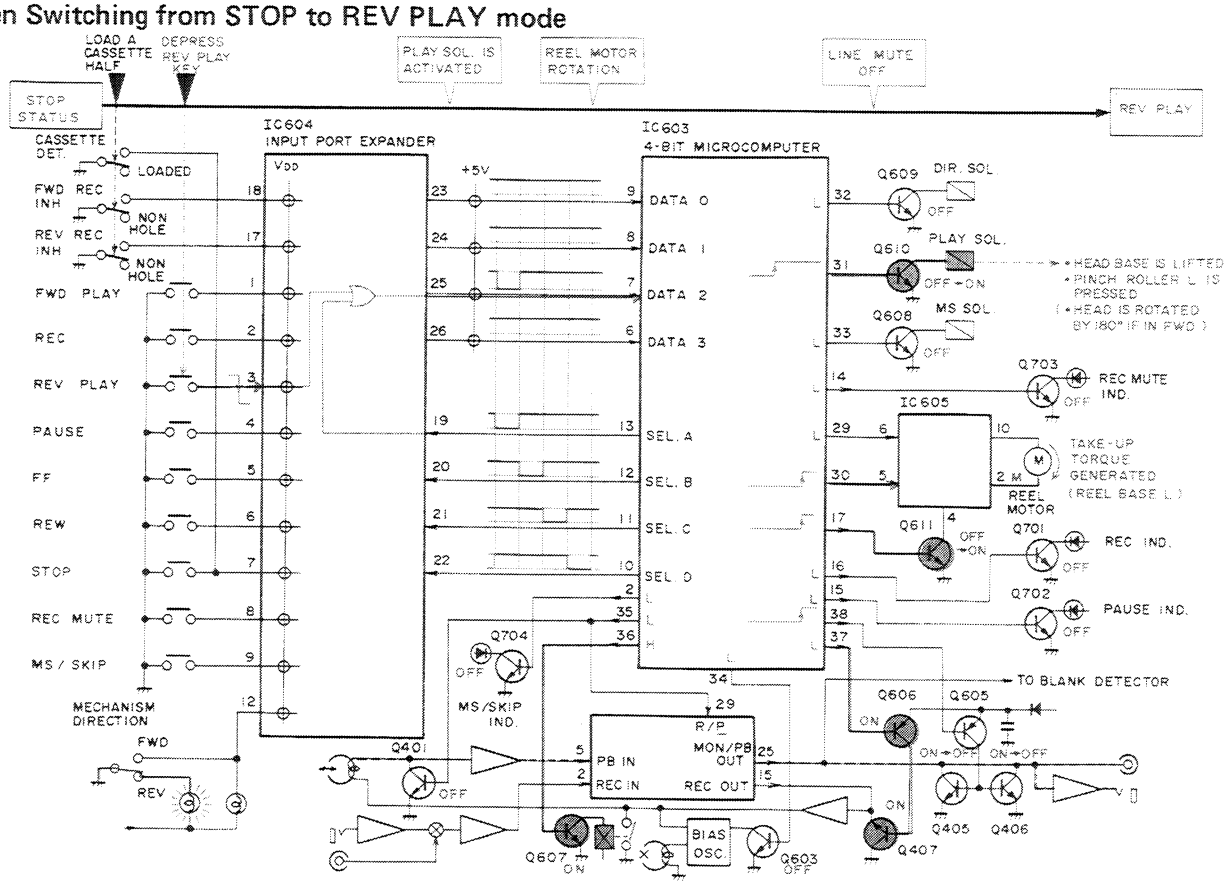


Fig. 4-8 When switching from STOP to REV PLAY mode

When Enabling Function

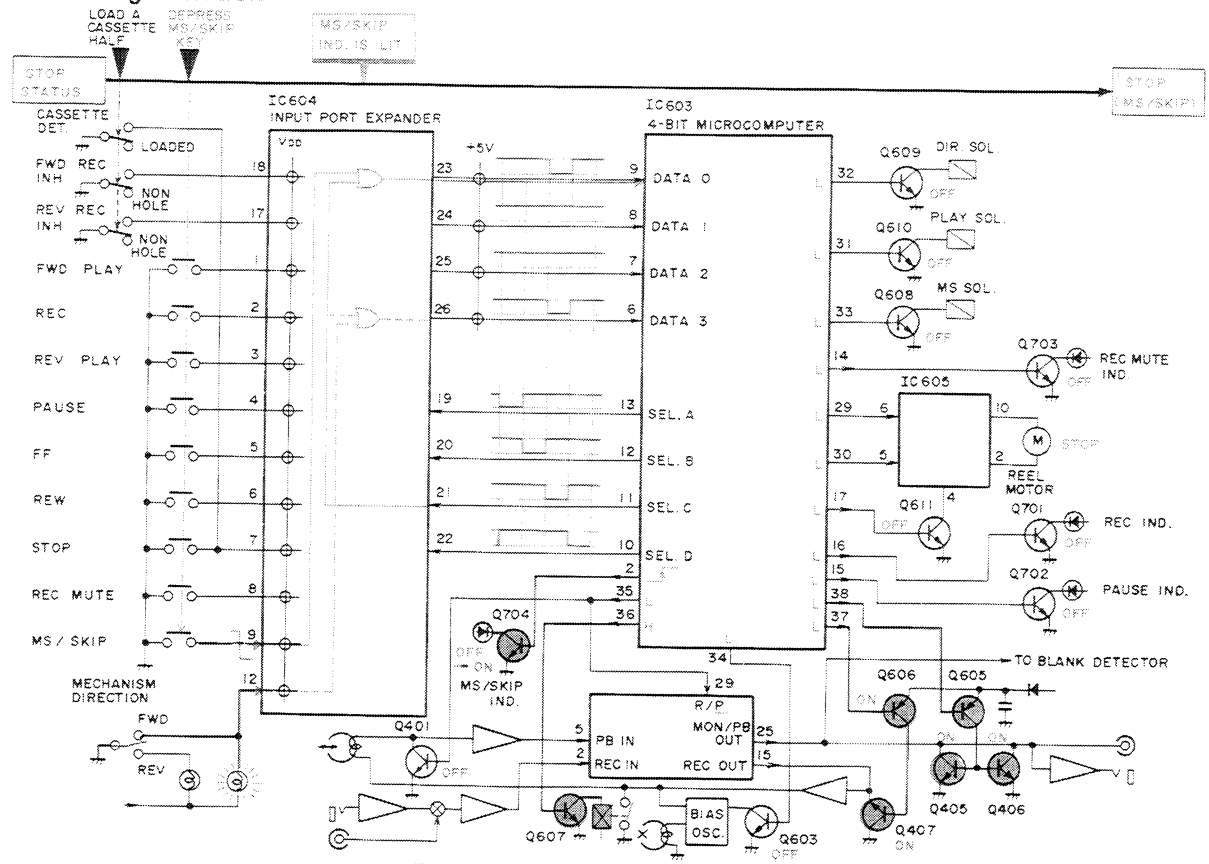


Fig. 4-9 When enabling MS Function

CUE (Music Search) Function

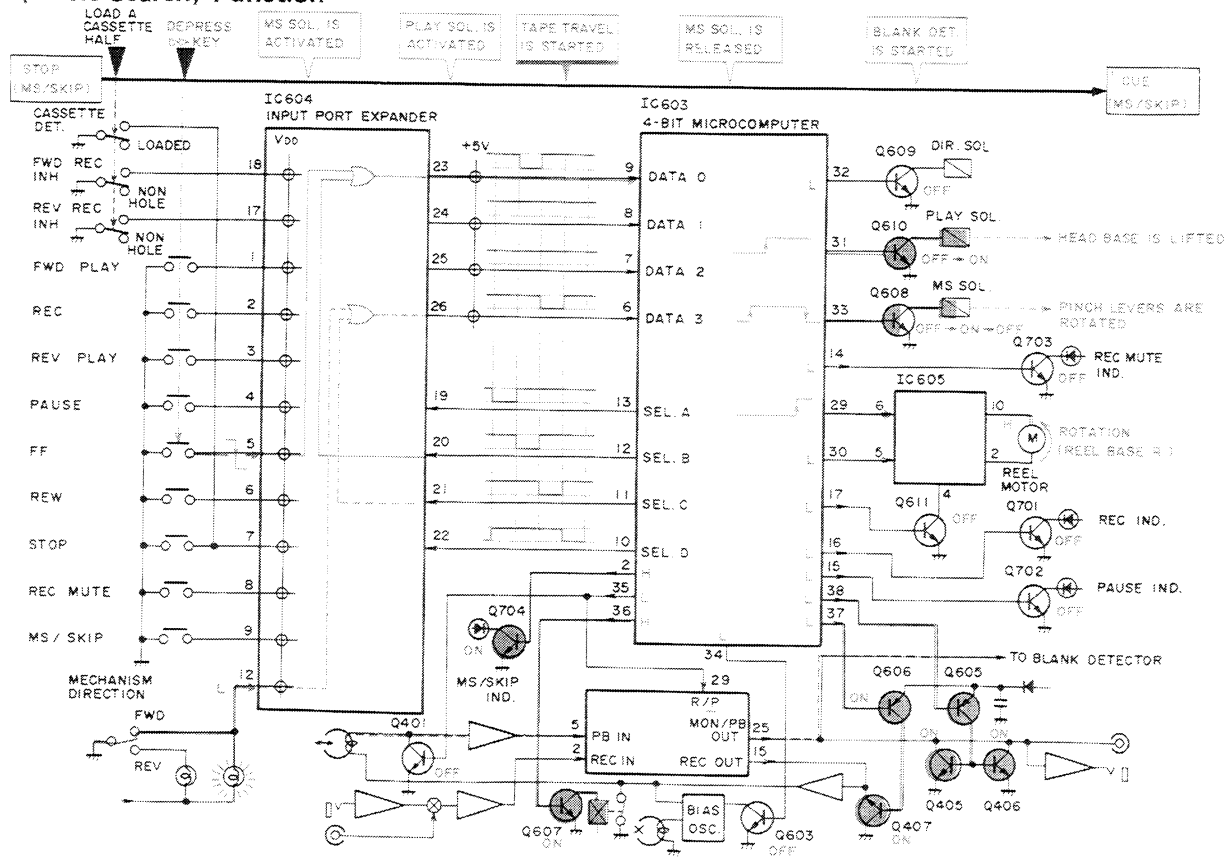


Fig. 4-10 CUE (Music Search) Function

Tape Leader Detector Circuit

The tape leader detection circuit functions in the auto-reverse mode to detect the point of transition from the coated portion to the leader portion of the tape. It then directs the mechanism to reverse the direction of travel, or places the unit in a STOP status when this event occurs from the fast-forward (FF) or rewind (REW) mode.

The detector uses an optical system based on an infrared LED whose emission is picked up by a phototransistor. The circuit is activated by detecting a difference in the amount of light passed by the coated portion of tape, and the amount passed by the transparent leader.

The output from pin 16 of PA3010 is converted to light by the LED, and passes through the path shown in Fig. 4-11 to be picked up by the phototransistor. During tape travel, the amount of light received by the phototransistor is quite small, so the input level at pin 7 is held low. This causes the charge and voltage at pin 3 and 4 to also be held low, presenting a low logic input to the + and - terminals of comparator. This results in a low output from pin 2. But as the transparent leader passes into the light path, the amount of light picked up by the phototransistor suddenly increases the input to pin 7. This causes pin 3 to snap high, consequently applying a high input to the + terminal of the comparator. Output from pin 2 then goes high. As pin 3 goes high, the capacitor connected to pin 4 starts charging, raising the input level to the — terminal of the comparator. When the level of the — terminal reaches that of the + terminal, the output from the comparator snaps from high to low, and the output pulse taken from pin 2 appears as shown in Fig. 4-13.

CPU PD4035 uses this output pulse to control the various mechanisms performing the mechanical functions of auto-reverse and automatic stop.

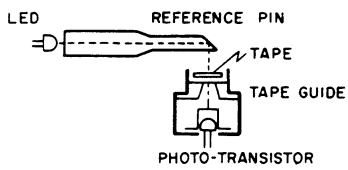


Fig. 4-11 Tape leader detector section

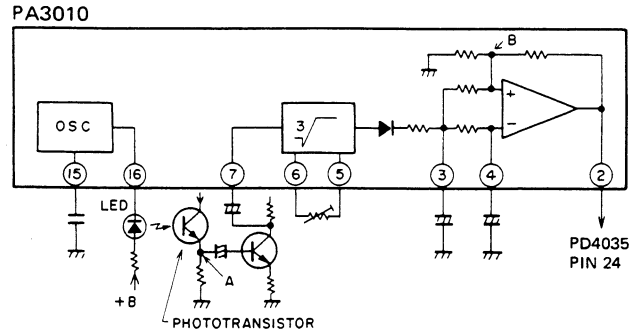


Fig. 4-12 Tape leader detector circuit

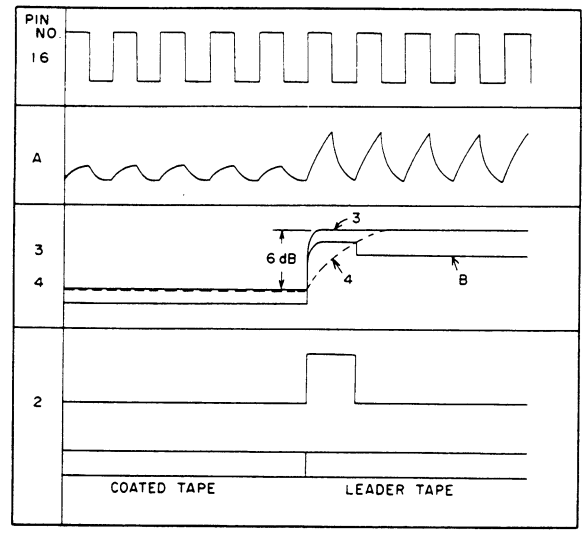


Fig. 4-13 Tape leader detector waves

Tape End Detector Circuit

Tape transport is monitored by a detector IC employing Hall elements. While the tape is moving, a magnetic disc is beltdriven by reel base (R), resulting in a detector IC generating pulse output signals. These pulse signals are applied to pin 23 of the control IC (IC603). When this pulse is maintained at eigher a low (L) or high (H) level for a period exceeding three seconds, PD4035 interprets that to mean the end of the tape and thus switches to the next mode of operation.

If the mechanism is in the fast-forward (FF), rewind (REW), or record-playback (REC/PLAY) mode, the next mode entered is STOP. If it is presently in the PLAY mode and the ⇄ reverse mode switch is selected, it also enters the STOP mode. But if ⟲ is selected, it first goes through a direction operation, then into a PLAY status.

Since CT-50R is equipped with a tape leader detector circuit, it goes into a STOP status or goes through a direction operation before reaching the point where the end sensor circuit is activated, so normally the end sensor circuit will not operate. However, where there is no leader on the cassette

tape, or where there is an insufficient difference in the infrared transmission factor between the coated portion and leader portion of the tape, or in case the reel motor stops rotating before the tape leader is detected, the end sensor circuit is then activated, placing the unit in the STOP mode. However, in the RECORDING (REC-PLAY) or PLAY mode, a direction operation may be called for depending on the position of the reverse mode switch.

Unrecorded Blank Detector Circuit

When the function key is placed ON, and the reel motor starts turning, pin 28 of PD4035 goes to a low level. When pin 28 goes low, pin 11 of the blank detector IC (PA3010) also goes low, lifting MS (Music Search) muting and commencing MS operations.

As MS MUTE is lifted, the signal is first amplified, then applied to pin 9, and its level is determined by the comparator in the next stage. Comparator output at point A is as shown in the accompanying table.

This output is used to turn Tr1 ON, and this in turn allows capacitor C connected to pin 12 to dump its charge through Tr1. Thus, pin 13 goes to a low level.

When there is no input signal present, Tr1 turns OFF, capacitor C starts recharging, and approximately 70msec later, a high level is output from pin 13.

Consequently, when an input signal is present, pin 13 is at a low level, and no signal produces a high output. This output is used by MS/SKIP operation.

MS/SKIP Operation

When the MS/SKIP key is placed ON, the FF (▷▷) key is activated, and when the beginning of a music selection is located, pin 13 of PA3010 drops from high to low. The trailing edge of the pulse effecting the level drop at the PD4035 pin sets the REWIND mode and rewinds the tape back to the beginning of the selection, and enters the PLAY mode.

At the end of the selection, if the unrecorded section of the tape (functioning to change the output from pin 13 from low to high) holds the level continuously high for over 12 seconds, PD4035 then selects the FF mode, continuing in that mode until the beginning of the next selection drops the level at pin 13 low. It then rewinds (◁◁) back out to the beginning of the selection, and enters the PLAY mode.

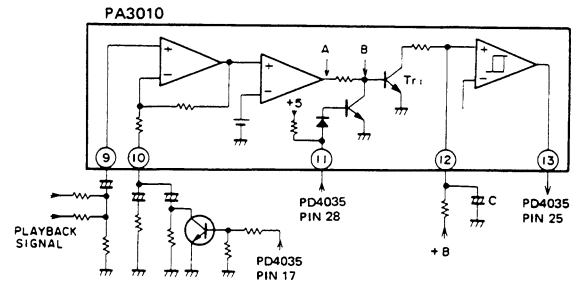


Fig. 4-14 Blank detector circuit

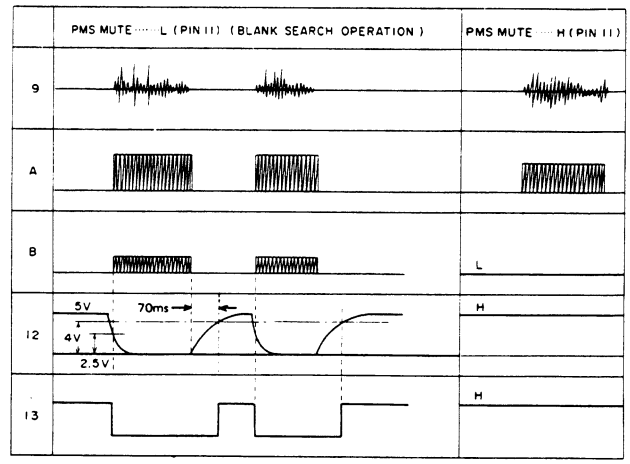


Fig. 4-15 Blank detector waves

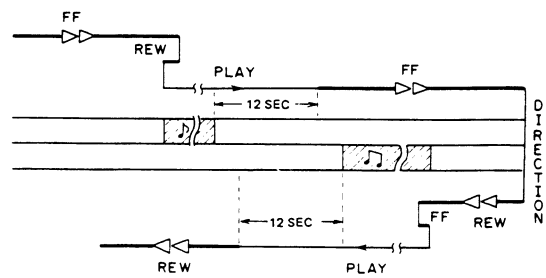


Fig. 4-16 MS/SKIP operation

ADDITIONAL

Service Manual

PIONEER

ORDER NO.
ARP-447-0

STEREO CASSETTE TAPE DECK

CT-50R

HEM, HB
HP, KC

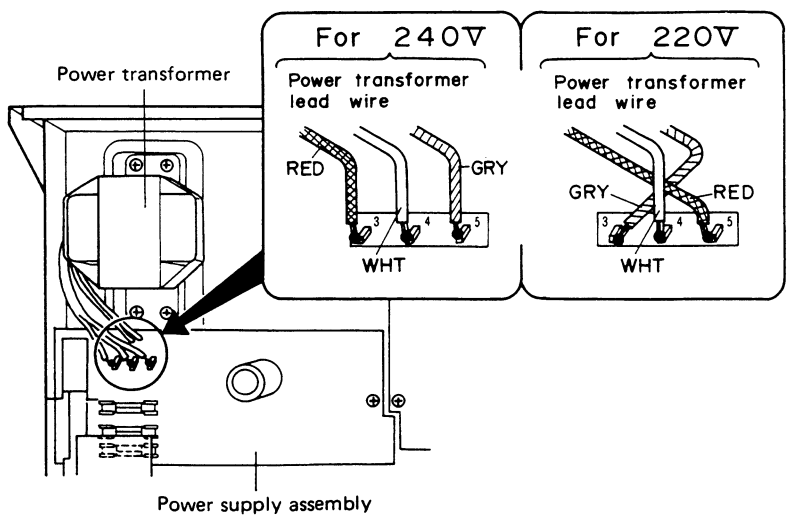
- This additional service manual is applicable to the CT-50R/HEM, HB, HP and KC types.
- The basic performance of the CT-50R/HEM, HB, HP and KC types is the same as the CT-50R/KU type. Please refer to the service manual (ARP-371-0) of the KU type with the exception of this manual.
- For the circuit and mechanism description, please refer to the another service manual (ARP-439-0).

Line Voltage Selection (For HEM, HB and HP types)

Line voltage can be changed with following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the connection of the power transformer lead wire.
4. Stick the line voltage label on the rear panel.

Part No.	Description
AAX-193	220V label
AAX-192	240V label



PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS [USA] INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

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1. CONTRAST PARTS

CT-50R/HEM, HB, HP and KC types are the CT-50R/KU type with the exception of following sections.

Miscellaneous Parts

Mark	Symbol & Description	Part No.				
		KU type	HEM type	HB type	HP type	KC type
	Power supply assembly	Non supply	Non supply	Non supply	Non supply	Non supply
⚠ ★	Power transformer (120V)	RTT-339	.....	.....	.....	RTT-347
⚠ ★	Power transformer (220V, 240V)	.....	RTT-341	RTT-341	RTT-341	.....
⚠	AC power cord	RDG-048	RDG-027	RDG-032	RDG-029	RDG-048
⚠	Strain relief	REC-395	REC-396	REC-396	REC-396	REC-395
⚠ ★★	FU1 Fuse (1.6A)	REK-074	.....	.....	.....	REK-074
⚠ ★★	FU1 Fuse (T315mA)	.....	REK-052	REK-052	REK-052	.....
⚠ ★★	FU2, FU3 Fuse (T500mA)	.....	REK-049	REK-049	REK-049	.....
	Packing case	RHG-603	RHG-607	RHG-607	RHG-607	RHG-607
	Operating instructions (English)	RRB-221	.....	RRB-221	RRB-221	RRB-221
	Operating instructions (English/German/French/Italian)	.....	RRE-053	.....	.....	.....

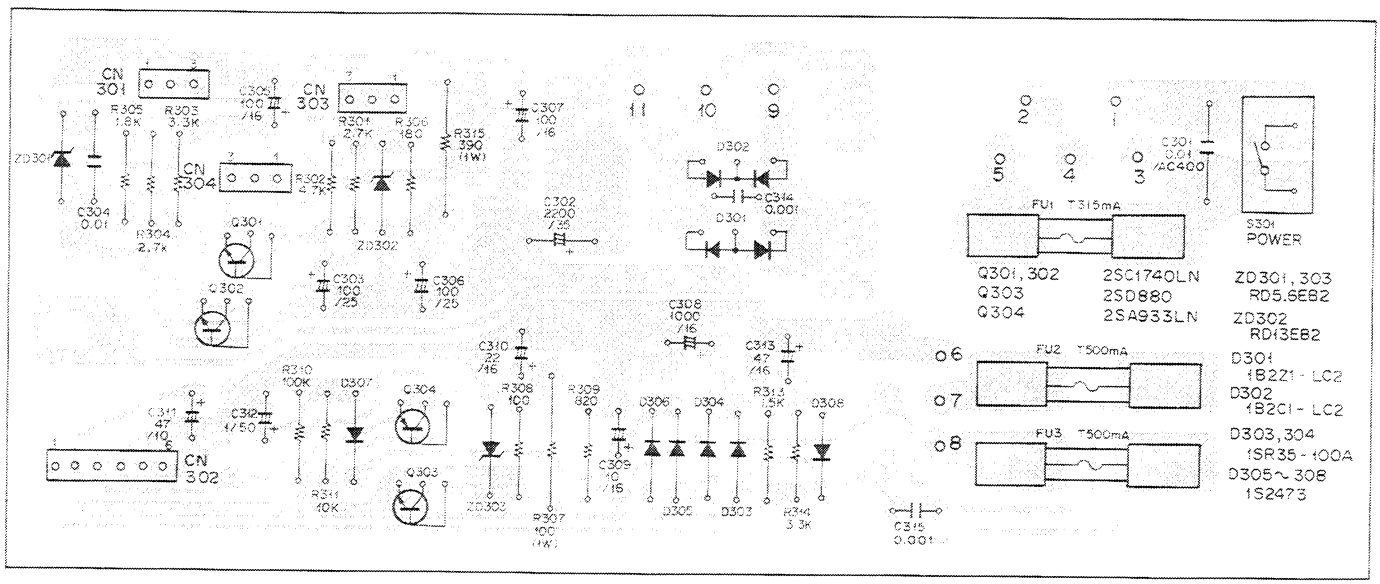
Power Supply Assembly

The power supply assembly (for HEM, HB, HP and KC types) is the same as the power supply assembly (for KU type) with the exception of following sections.

Mark	Symbol & Description	Part No.			Remarks
		KU type	HEM, HB, HP types	KC types	
	Capacitors				
⚠	C301 (0.01/AC250V)	RCG-008	.....	RCG-008	
⚠	C301 (0.01/AC400V)	.....	RCG-009	.....	
	C314, C315	.....	CKDYF 103Z 50	.....	
	Semiconductors				
★	D305, D306	1S2473	1S2473	.....	
⚠ ★	D305, D306	.....	.....	1SR35-100A	

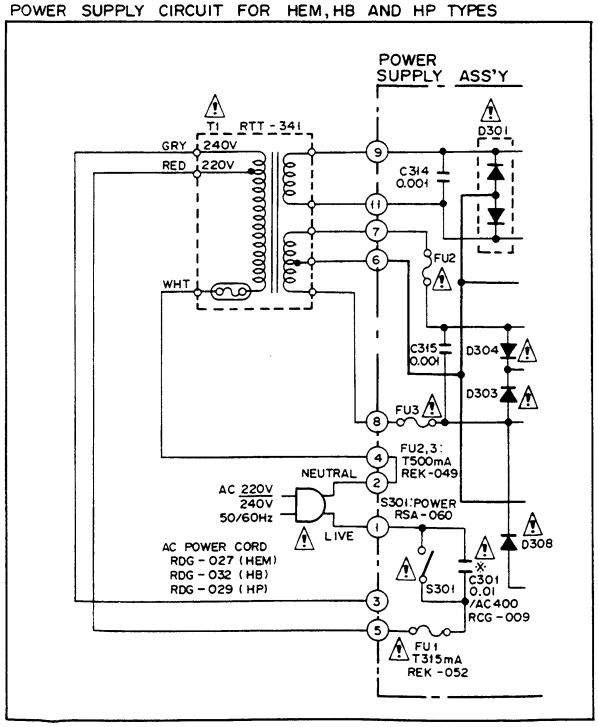
2. P.C. BOARD PATTERNS

POWER SUPPLY ASSEMBLY
For HEM, HB and HP types



3. SCHEMATIC DIAGRAMS

POWER SUPPLY CIRCUIT FOR HEM, HB AND HP TYPES



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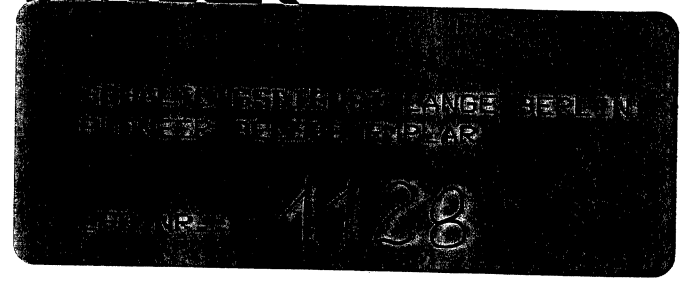
ADDITIONAL

Service Manual

PIONEER®



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ARP-447-0

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CT-50R

HEM, HB
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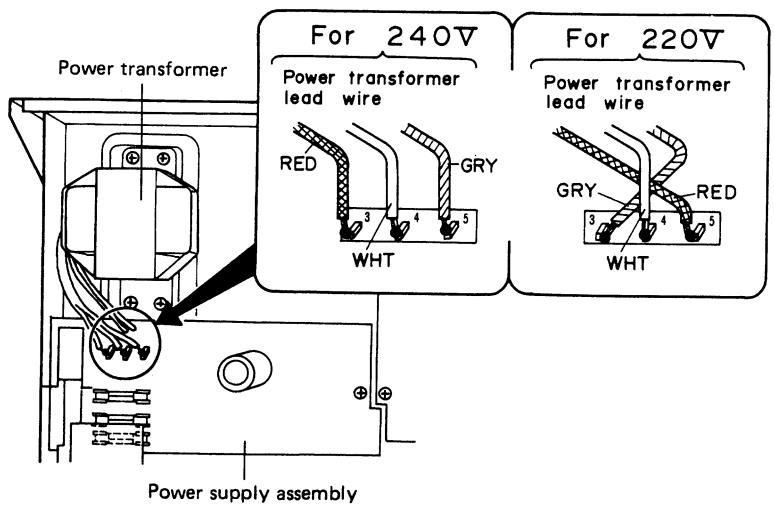

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	C314, C315	.....	CKDYF 103Z 50	.....	
	Semiconductors				
★	D305, D306	1S2473	1S2473	.....	
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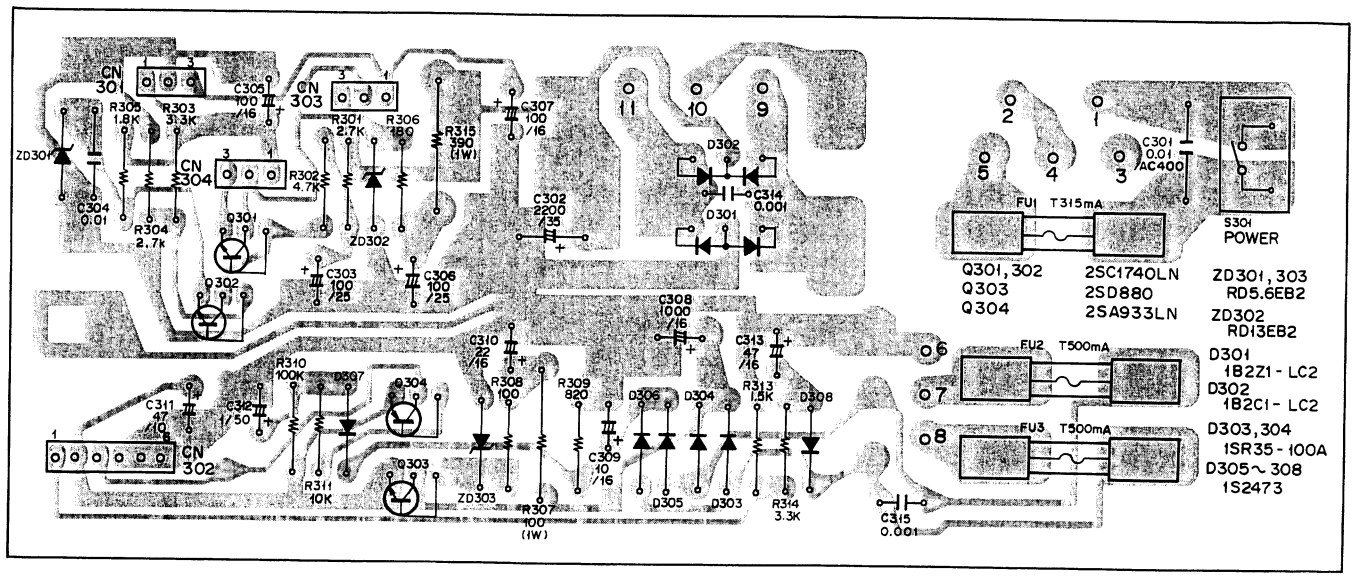
POWER SUPPLY ASSEMBLY

For HEM, HB and HP types



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